American Machinist

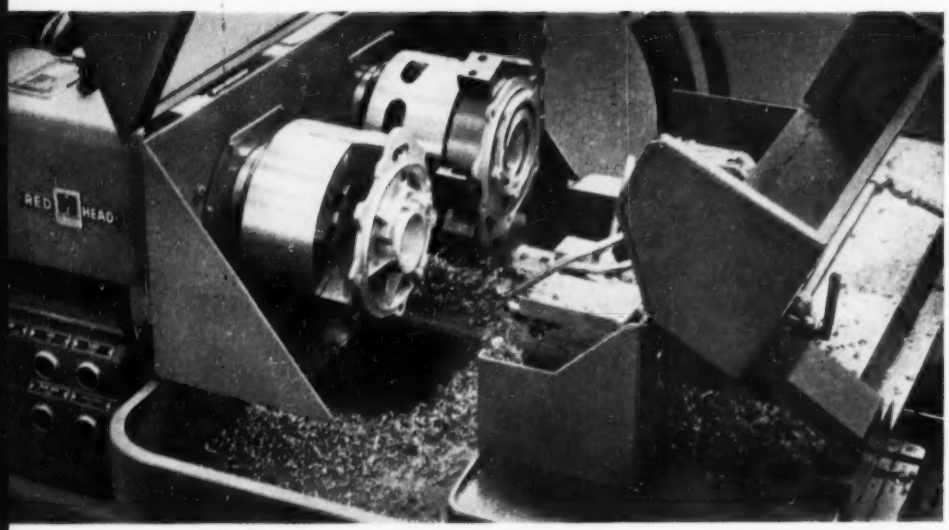
PRICE ONE DOLLAR

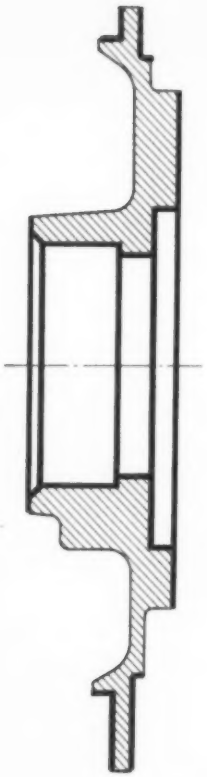
JANUARY 19, 1953

McGRAW-HILL MAGAZINE OF METALWORKING PRODUCTION

1953 PRODUCTION PREVIEW

13 surfaces borized in 3 operations on 2 Heald Bore-Matics



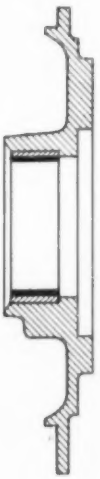


The 12 surfaces indicated above are precision borized on the Heald Model 221 Bore-Matic shown at left — one station for finishing each side of the work.

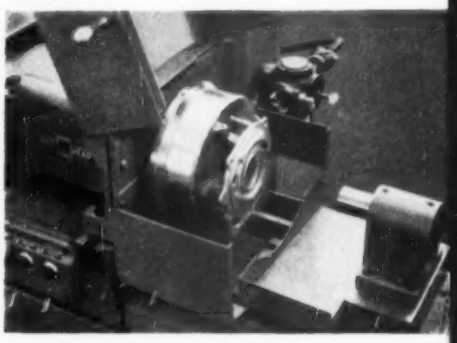
● Here's another example of how Heald machines make fast work of a complicated, multi-surface borizing job. The parts — aluminum die-cast pump casings — are first bored, faced, turned and chamfered on 12 different surfaces with the two-station Model 221 Bore-Matic shown above. A bridged-over quill for the boring operations allows the boring tool to remain fixed while the facing tools are indexed laterally. One station is used for each side of the work.

After part has been finished on this machine, a bronze bushing is pressed in and work is transferred to the Model 121 Bore-Matic shown at the right. Here the bushing is precision bored by a single tool on the machine table.

Remember—when it comes to precision finishing, it pays to come to Heald.



The final operation — finish boring of the bronze bushing inserted in the work — is done on the single station Model 121 Bore-Matic shown below.



HEALD

Case Study
No. 2233-96 in
PRECISION PRODUCTION

INTERNAL AND ROTARY SURFACE GRINDING MACHINES AND BORE-MATICS

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Branch Offices: Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

American Machinist

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40th Annual Review Number

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Chips and Quips

Distillation . . . Our 1953 Production Preview combines, in classified form, summarized descriptions of all items on new equipment, materials, and parts which appeared in our pages during 1952. This distillation process is pictured on our cover for this issue, painted by Art Director Richard Rooman. The stack of magazines at left is, of course, 1952 issues. There was a fine point to be considered here—you received last year 27 issues of *American Machinist*, although only 26 carried new-production-equipment descriptions. What to do: Should the stack be 26, or 27? As most artists do, "Dick" straddled the fence. He pictured 27 issues, but faked the numbers so they total only 26—and he made the mighty 75th Anniversary Issue the same size as the others, although his overtime during the early Fall would give him a clear recollection of relative size.

This cover, incidentally, embodies an old illustrative trick that worried us in our youth. The "Old Dutch Cleanser" cans used to show a lady holding a can of "Old Duch Cleanser"—and *that* can showed a lady—and so on. Don't stop to think about it, or you'll lie awake worrying about how far such a sequence can be carried. We did.

Preview . . . Our classified picture-and-caption capsulized descriptions of new equipment, materials and parts, previously mentioned, total something more than 1400 items—over 200 above last year's Preview, published Jan 21, '52. This is, in effect, your annual catalog, subdivided by type of equipment, with major sections distinguished by distinctive colors. All items described products made available to the American market for the first time during 1952, and described in our every-issue equipment-news department during that year. Together, they constitute our 40th such review—a milestone.

Statistics . . . Our current Special Report—No. 327 in a series that began a dozen years ago—gives you statistics on Metalworking for 1952 and an informed look at 1953. Prepared by our Economics Staff, it provides not only the data available from various sources, but also some interpretations and special information not available elsewhere. Keep it for use all through the coming year. It provides a basis for detailed figures which we'll publish in each succeeding 1953 issue.

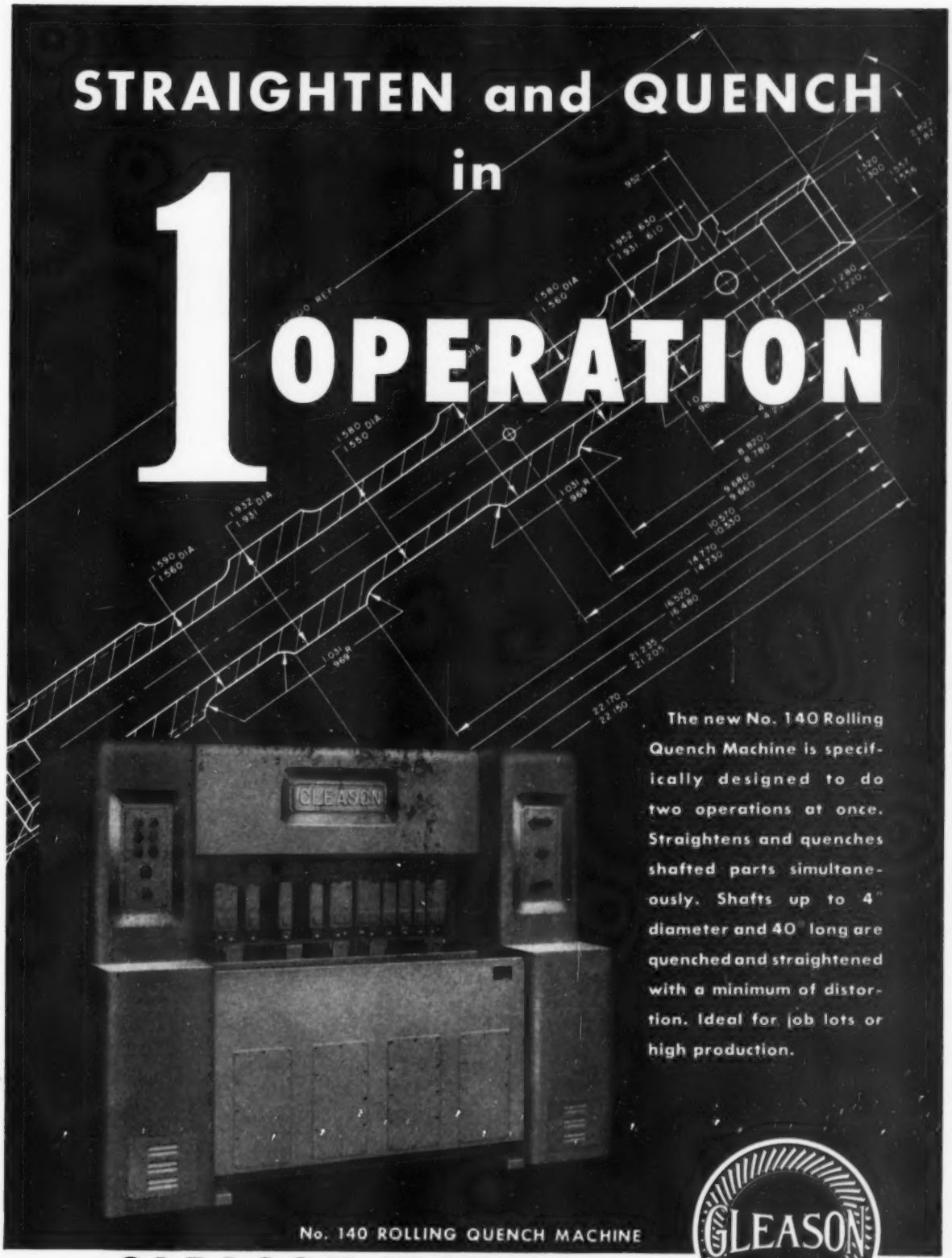
Psychology . . . Two 10-ton trailers, each 26 ft long, with automatic thermostatic control for heat, humidity, and air conditioning, so they can be operated in a wide range of temperatures, are the basis of the US Army's latest development in psychological warfare as a combat weapon. Inside them is a high-speed printing unit, capable of turning out 40,000 leaflets an hour in any of a dozen foreign languages. . . . That would have been an answer on our 75th Anniversary Issue—providing the unit can bind at a comparable rate. Our binder got only 2000 a day.

Colors . . . We have, for some years, used colored inks to distinguish certain articles or reports. We follow that system in this issue to ease your reading. Thus the statistical material is in green and black, the items on machine tools and attachments, tools, and accessories in dark green; forging, forming, and casting, heating, heat-treating in brown, other sections in blue. Within each major group, subgroups are identified by corner labels on the pages.

Coming . . . *AM* for Feb 2 will be headed by a very special Special Report on shop methods and management at Graflex—20 pages of detailed data, in most cases shown in pictures. . . . The lead article will give you something to think about, too—how inexpensive air conditioning can be, and how much it can save. There'll also be articles on Ford's method of organizing automation, on making flanged parts by splitting, on coated brazing metal, and on flame heaters for dies.

CHARLES DELMAR TOWNSEND received his BSME from Northeastern University, Boston, in 1934 and has since worked in both engineering and management capacities. He has been in the fields of building materials, seamless steel tubing, powdered metal products, gliders, pole line hardware, transmission chain and radio antenna. During World War II he was with the WPB Aircraft Scheduling Unit for a time. He has operated a professional expediting service, offering assistance to small business, since 1950 and is now director of manufacturing for the LaPointe-Plascomold Corp, Rockville, Conn. Among his many technical articles are two in *American Machinist* (Sept 13, 1945; July 4, 1946) and a number of discussions of our Round Table subjects. He has also published a brochure on Preventive Maintenance (1951). He is a registered professional engineer and is a member of the ASME, ASM, and the National and Conn Societies of Professional Engineers.

STRAIGHTEN and QUENCH in 1 OPERATION



The new No. 140 Rolling Quench Machine is specifically designed to do two operations at once. Straightens and quenches shafted parts simultaneously. Shafts up to 4" diameter and 40" long are quenched and straightened with a minimum of distortion. Ideal for job lots or high production.

No. 140 ROLLING QUENCH MACHINE

GLEASON WORKS

BUILDERS OF BEVEL GEAR MACHINERY FOR OVER 85 YEARS

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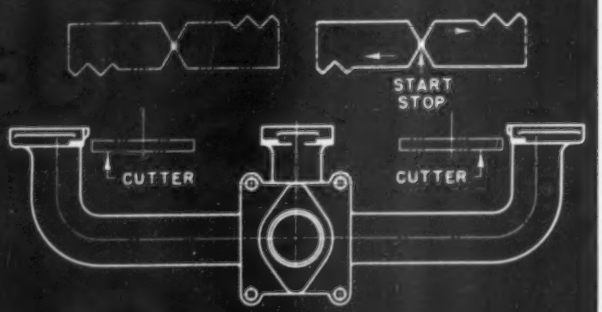
Replacing the overarm with a two-spindle head

REDUCES COST OF MILLING



Drawing of part and diagram of automatic cycle

OPERATION ON MANIFOLD

CINCINNATI *No. 1-18 Plain Automatic Milling Machine Catalog No. M-1555-2 containing complete specifications will be sent on request.*

production data

Part name	Intake manifold
Material	Cast iron
Operation	Mill flanges for stud washers
Depth of cut	⅛"
Cutters	4½" diameter, inserted blade, sintered carbide
Production	125 per hour
Machine	CINCINNATI No. 1-18 Plain Automatic Milling Machine

Multiple spindle milling machines usually save time by milling two or more parts simultaneously. In this example, only one part is milled at a time. However, there are four surfaces and they are milled in pairs.

¶ Cincinnati Application Engineers assigned the job to a CINCINNATI No. 1-18 Plain Automatic Milling Machine. A two-spindle head, driven by the machine, is mounted in the overarm dovetail bearing at the top of the column. A manually operated fixture and two 4½" diameter sintered carbide cutters complete the equipment. This machine, with very little tooling, mills the flanges on manifolds at the rate of 125 per hour.

¶ CINCINNATI No. 1-18 Plain Automatic Milling Machines offer several advantages for work of this type:

(a) Automatic backlash eliminator for down-milling operations, or alternately up and down milling.

(b) Automatic spindle stop protects the operator.

(c) Fast automatic table cycles, with 300" per min. rapid traverse.

Other advantages for production milling operations within a 3 hp range are outlined in Sweet's Catalog File for Mechanical Industries. Complete data may be obtained by writing for catalog No. M-1555-2.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO

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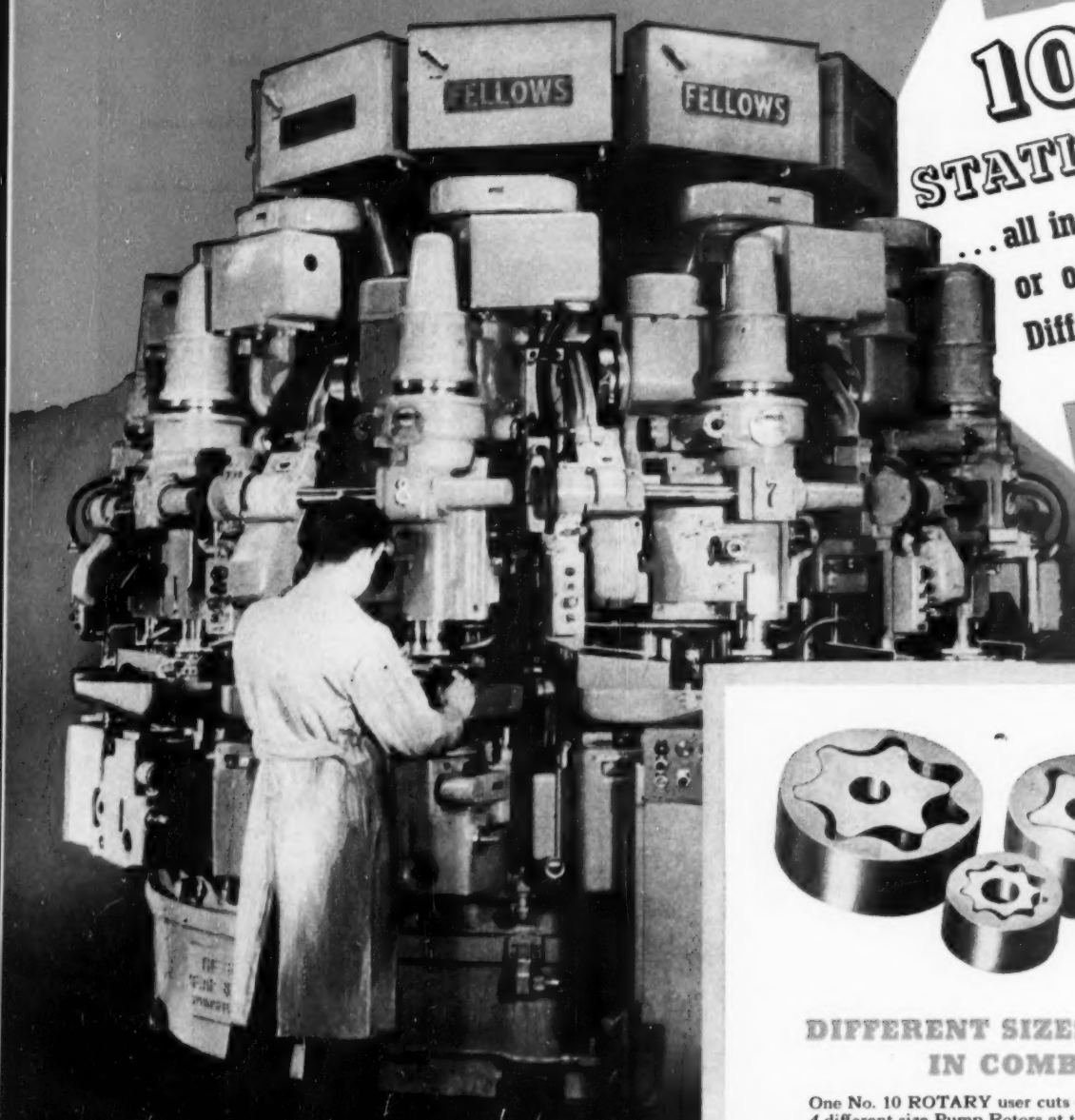
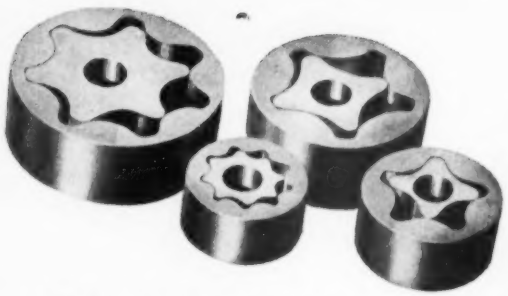
MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

Today's Trend in Machine Tool Design:-"HIGH



10 STATIONS

...all in One Part, or on 2 to 10 Different Parts



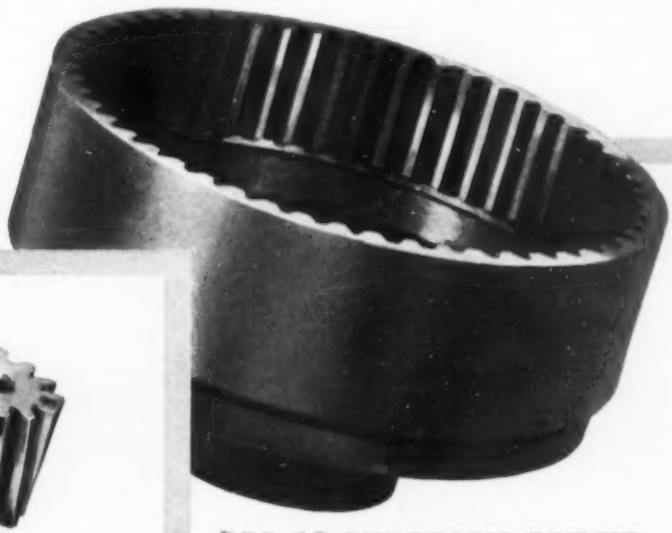
DIFFERENT SIZES IN COMBINATION

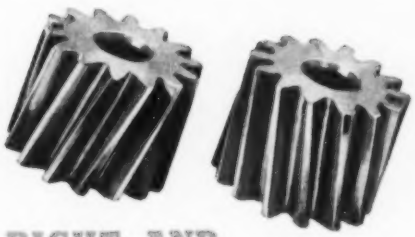
One No. 10 ROTARY user cuts the inner profile of *4* different size Pump Rotors at the same time. Production is proportioned—3 stations each for the 1.5" and 2.25" O.D. sizes and 2 each for the 1.75" and 2.75" O.D. parts. Feeds are different for each of the four parts. Strokes per minute of cutter set at 330 for one part and 287 for the other three. Production is . . .

ONE EVERY 10 SECONDS

PRODUCTION with MAXIMUM FLEXIBILITY"

THE FELLOWS NO. 10 ROTARY carries gear-cutting machine design far ahead in this exact direction. A GEAR SHAPER engineered for heavy duty stock removal at highest speed, it is at the same time a precision tool for work of high accuracy and fine finish... *AND*, each of the 10 gear-cutting stations is a completely self-contained production unit, on which the feed, speed and length of cutter stroke can be adjusted independently. You can cut 10 identical parts at all 10 stations, or any desired combination of different parts—as required... Our engineers will be glad to confer with you on general gear production or specific problems.





RIGHT- AND LEFT-HAND PINIONS IN 50/50 QUANTITY

One automobile transmission plant has demonstrated that the No. 10 ROTARY can set records for quality and speed in turning out 1.375" P.D. helical Pinions. *AND* one big FELLOWS machine can handle requirements for BOTH right- and left-hand parts. Material is SAE 1113. Pinions are 14 teeth, 10 pitch, 20° p.a., 13° 7' helix angle and 1¼" face width. For fine finish, two cuts are taken while the turret makes on revolution. Parts come off the machine at the rate of...

ONE EVERY 21.4 SECONDS

ALL 10 STATIONS SET UP FOR ONE GEAR PART

Another big automobile plant cuts the internal spur teeth on cast iron drum gears of this design. Here total machine production concentrates on the one part. Design calls for 54 teeth, 10/20 pitch, 30° pressure angle, and 1-3/16" face. One single cut produces good gears at...

ONE EVERY 26.1 SECONDS

Fellows

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Give Top Production Output

BOWGAGE WHEELHEAD SOLVES MASS PRODUCTION GRINDING

When it comes to mass production grinding, you can't beat Van Norman specialized Production Grinders for lowest-cost-per-piece production grinding. By taking one or more Van Norman Bowgage Wheelheads and mounting them on a suitable base, there is practically no limit to the work that can be ground automatically... diameters, tapers, shoulders, etc. These Bowgage Wheelheads are individual automatic integral grinding units. They are complete with rough and finish feeds, sizing, automatic cycling and rapid traverse.

VAN NORMAN COMPANY

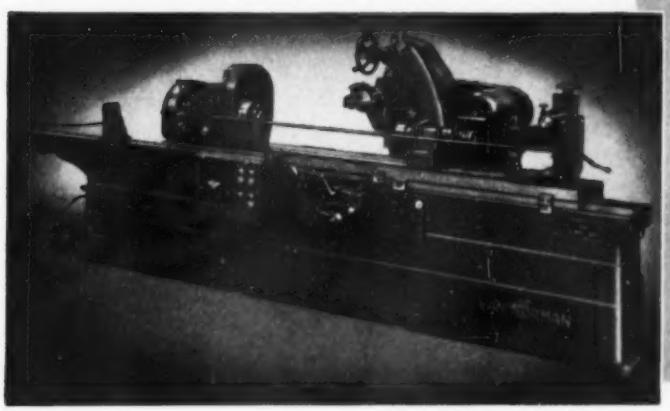
Production Grinders

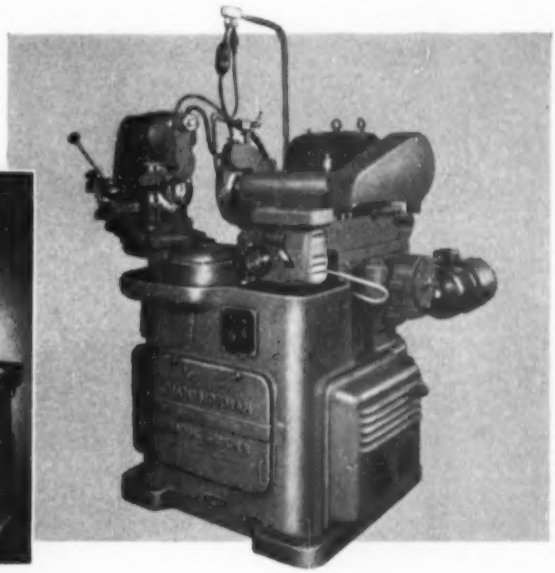
...Reduce Grinding Costs

Throughout the years, Van Norman has pioneered in production grinder advancements. Perhaps best known is the Van Norman Radius Grinder which, since 1912, has enjoyed world-wide acceptance as the "standard" for grinding ball races and other spherical surfaces. Today, Van Norman engineering and research brings forth new revolutionary designs and features that give the Van Norman production grinders performance never before thought possible.

The Van Norman line of grinders includes the famous Van Norman Radius Grinders for grinding ball races, Van Norman production grinders which feature the well known Bowgage Wheelhead that simplifies mass production grinding, and Van Norman Spline and Gear Grinders for fast, accurate grinding of spline shafts and gears, economically.

Write for information describing each of Van Norman's grinders.





VAN NORMAN

SPLINE AND GEAR GRINDERS

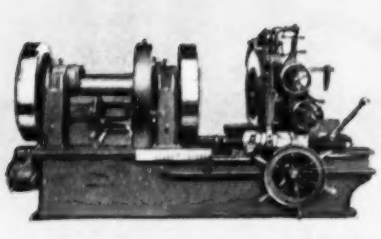
Van Norman Spline and Gear Grinders have been developed from 30 years of gear and spline grinding experience. Operating on an automatic closed cycle, with formed wheels, these machines produce results in finish and accuracy with a speed that will bring out hidden profits.

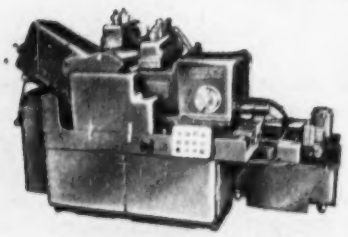
VAN NORMAN

OSCILLATING GRINDERS

Van Norman Oscillating Grinders are available in a wide range of types and sizes for ball race work and many radial types of industrial application. These grinders have a built-in facility for grinding double-row races.

SPRINGFIELD 7, MASSACHUSETTS





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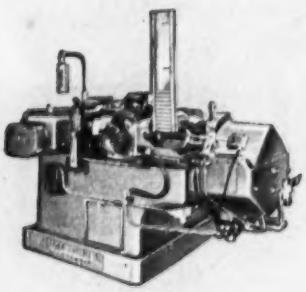
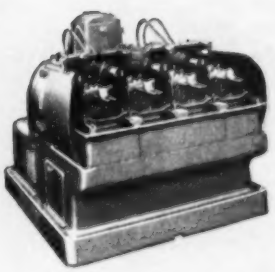
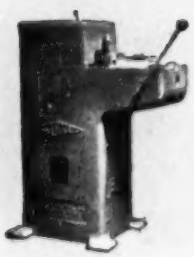
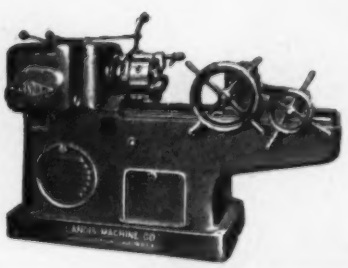
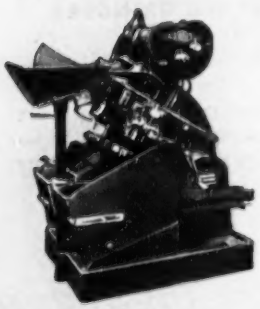
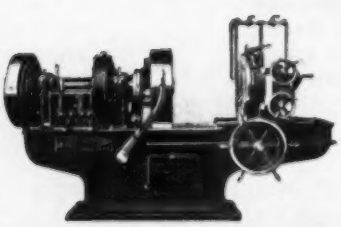
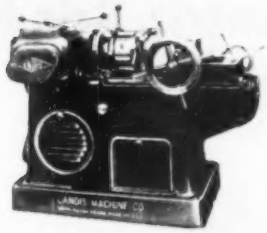
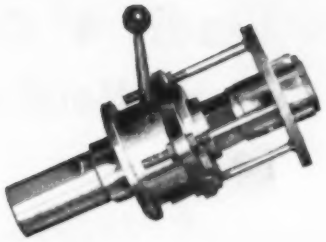



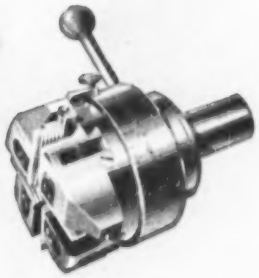
LANDIS *Machine*



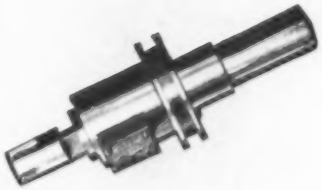


THREADS

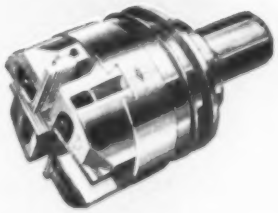


50TH ANNIVERSARY FOR DEFENSE AND PEACE

Threads to open bomb doors, or secure warheads on naval rockets —threads to help steer pleasure cars, or to adjust microscopes in research. All of these are produced by one or another of the many types of Landis Threading Equipment, equally adapted to making America strong in war, or building a land of plenty in peace.

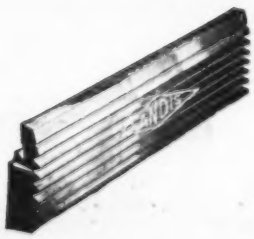


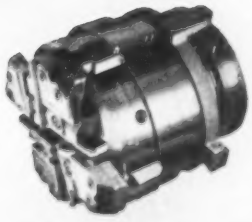
Behind this equipment—pipe, bolt, and nipple threading machines, centerless thread grinders, collapsible taps, die heads, chasers —lie years of experience in thread generation and threading equipment manufacture. We offer this know-how to all manufacturers through our Thread Engineering Service. We are ready to help where we can with original thread design, development of threading methods, or adaptation of threading equipment for production. Send us your specifications, or our representative will call at your convenience on request.



LANDIS

COMPANY · WAYNESBORO PENNSYLVANIA

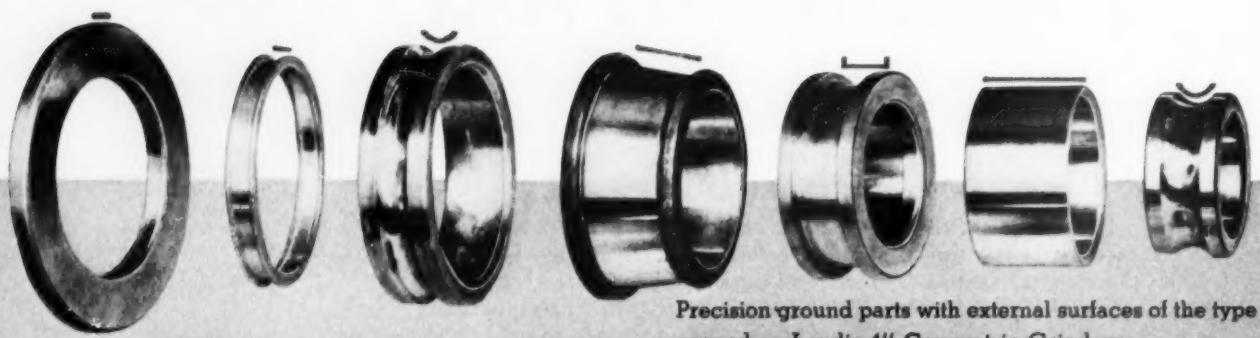




NEW • Landis 4" Concentric Grinder • Work Holding Method

Grinds External Surface Concentric to

Produces Precision Grinding Results at Commercial Grinding Costs



Precision ground parts with external surfaces of the type ground on Landis 4" Concentric Grinders.

Super Precision Tolerances — to low limits for

- Concentricity of external surface with bore
- Parallelism of profile with face

High Production — automatic operation for

- Straight surfaces
- Profiled surfaces
- Tapered surfaces

Extra grinding operations often can be eliminated by this new method. Production estimates and tooling suggestions will be made on the basis of your blueprints. Send for new Bulletin CX-52.

LANDIS TOOL COMPANY / WAYNESBORO, PENNA., U. S. A.

Bore . . . *Automatically*

Operator loading work chute on Landis 4" Concentric Grinder.

LANDIS

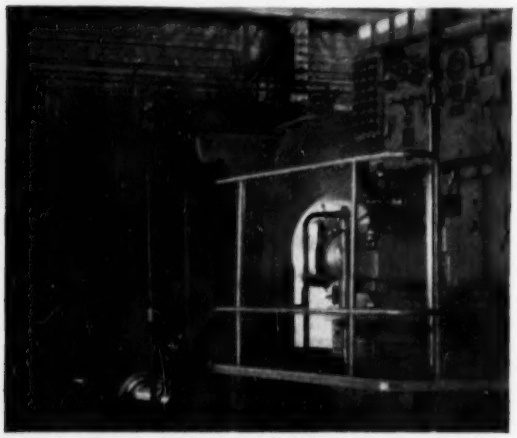
precision grinders

Here's extra capacity for huge,

Now, throughout the G&L 50 Series' wide work range, you can accurately bore, mill or face up to 60" from the headstock . . . parallel or at right angles to the spindle

G&L 50 Series Horizontal Boring, Drilling and Milling Machines, with their open construction, are already well-known for their *extra-big-work* capacity. Now, they can be built with a new underarm support which provides hitherto impossible rigidity for heavy-duty milling, facing, boring and shaping tools *at distances to 60 inches* from the headstock face.

Six standard model tools can be easily mounted on the underarm: 46" face plate drive, 48" continuous feed facing head, 90° angular milling attachment, 90° offset milling attachment, spindle support and shaping attachment.



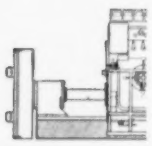
Boring head in operation on a difficult interrupted cut inside a large combination fabricated and cast housing.

Simplifies 75- to 125-ton jobs

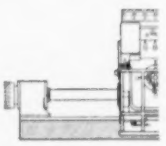
This new development gives you the flexibility necessary to keep costs in line on both routine or difficult 75- to 125-ton jobs. By increasing the number of operations you can perform without resetting the workpiece, it greatly reduces handling, setup and labor costs.

If you'd like to know how G&L machines can improve your shop's work capacity . . . give you increased production at far lower cost — contact your nearest G&L representative or write direct. BUT DON'T DELAY . . . DELIVERY ON G&L MACHINES MAY BE SOONER THAN YOU THINK!

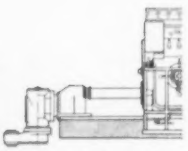
TYPICAL WAYS YOU CAN USE UNDERARM



Underarm extended spindle support with continuous feed facing head.



Underarm extended spindle support with face mill.



Underarm right angle swivel milling attachment with offset attachment.

G-24

GIDDINGS & LEWIS

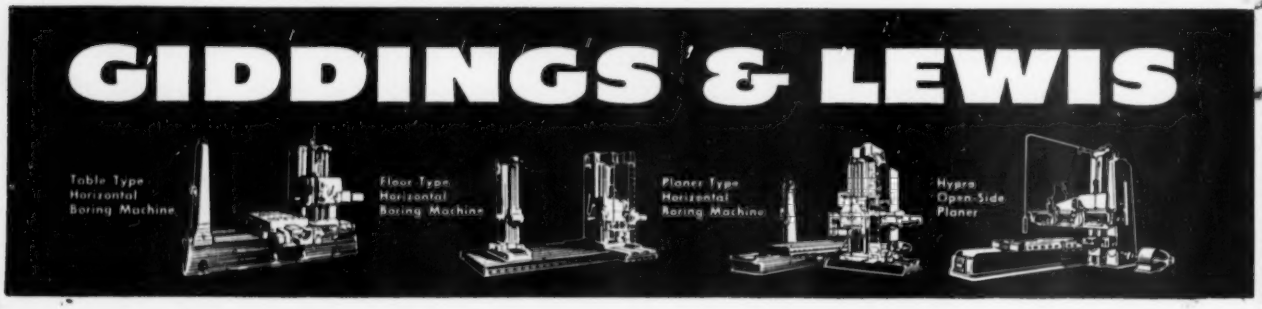
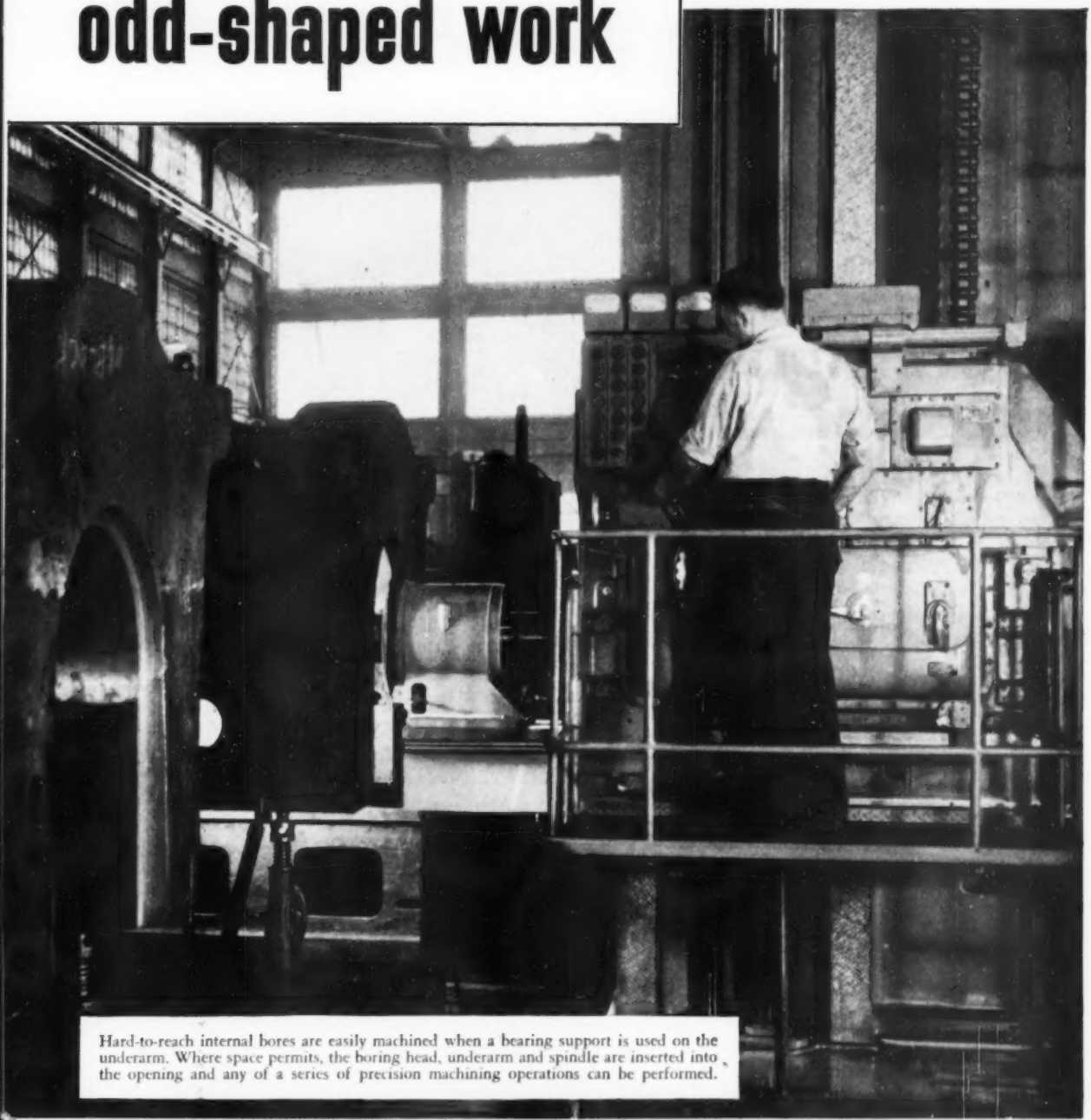


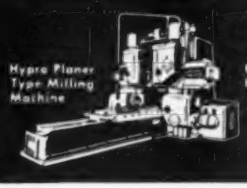
Table Type Horizontal Boring Machine
Floor Type Horizontal Boring Machine
Planer Type Horizontal Boring Machine
Hydro Open-Side Planer

odd-shaped work

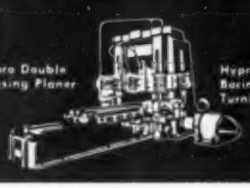


Hard-to-reach internal bores are easily machined when a bearing support is used on the underarm. Where space permits, the boring head, underarm and spindle are inserted into the opening and any of a series of precision machining operations can be performed.

G&L HYDRO MACHINE TOOL CO.



Hydro Planer Type Milling Machine



Hydro Double Housing Planer

Hydro Vertical Boring and Turning Mill

FOND DU LAC
WISCONSIN

SKF RACES *Against Time...*

with the new

GISHOLT NO. 24 HYDRAULIC AUTOMATIC LATHE

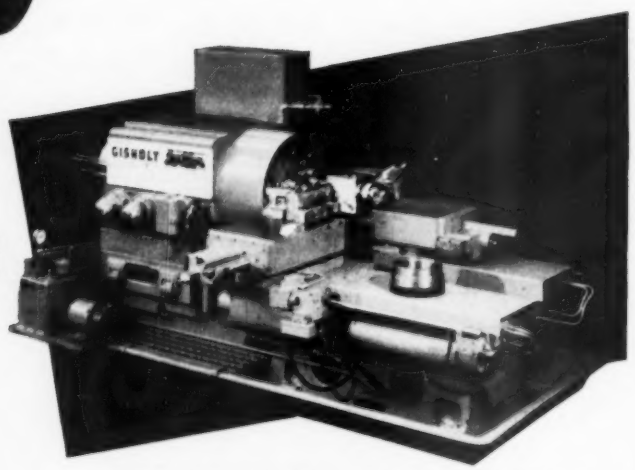
When it comes to fast production of top quality spherical roller bearing races, SKF doesn't fool.

These big Gisholt No. 24 Hydraulics remove 34 lbs. of metal in two operations in a total of only 2.80 minutes' machining time on each of two machines. All cutting is on 52100 bearing steel and done at speeds of 325 to 350 f.p.m.

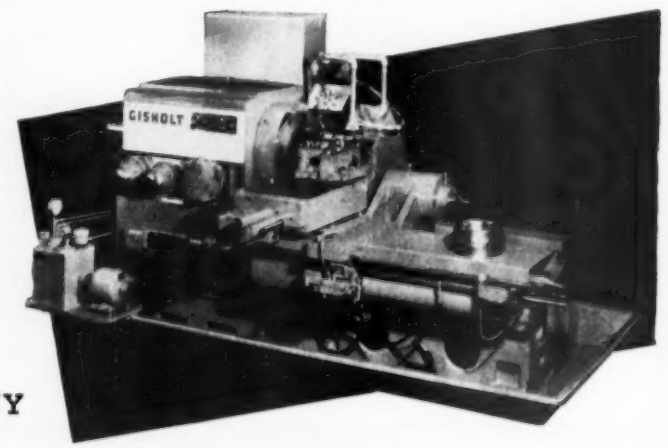
Speed is important, of course. But precision is the governing factor. How the Gisholt No. 24 does the job is a story that might mean real savings for you, too.

The No. 24 Hydraulic Automatic Lathe is a larger version of the famous No. 12 that has an outstanding success record on hundreds of jobs. If you have large volume precision work up to 24" diameter, the Gisholt No. 24 is the machine to investigate. Write for full information.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

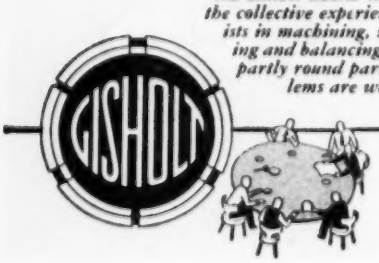


First Operation: Chucked on OD with 3-jaw hydraulic chuck, part is turned up to the jaws, faced, chamfered, bored and bore radius formed. Cam relief on rear tool block turns boring bit clear of workpiece as it is withdrawn.

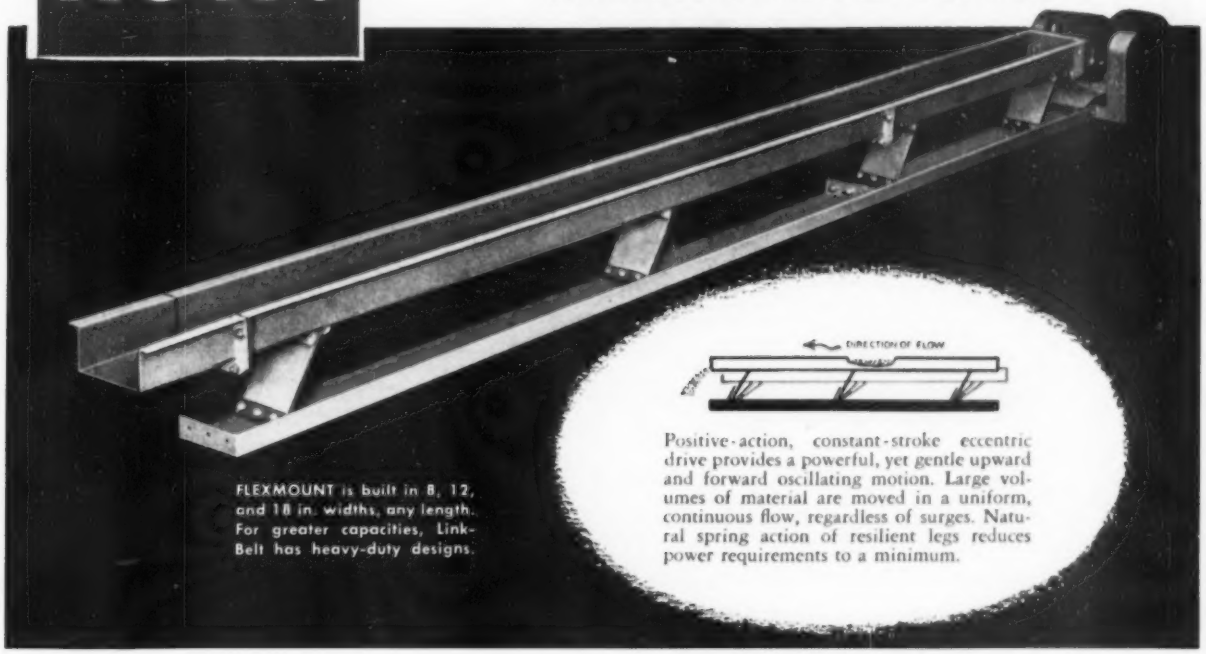


Second Operation: Part held on expanding arbor by hydraulic pressure is finish turned, faced, chamfered and bore radius formed. Special rocker arm type carriage at rear tips in shaving tools to form both roller grooves with feed of .003" to .0045."

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*



NOW! FLEXMOUNT Oscillating Conveyors available from stock



FLEXMOUNT is built in 8, 12, and 18 in. widths, any length. For greater capacities, Link-Belt has heavy-duty designs.

Positive-action, constant-stroke eccentric drive provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Natural spring action of resilient legs reduces power requirements to a minimum.

Stock Sections Make Flexmount Positive-Action Oscillating Conveyors—Easy to Order—Easy to Install

HERE'S a big step forward in cutting costs in handling chips, turnings, blasting shot, punchings, stampings. Link-Belt now offers you its new FLEXMOUNT design for immediate delivery from stock.

Stock sections of 8, 12, and 18 in. widths in any length, make ordering easy. Because production-line techniques are used in manufacture, easy-to-install FLEXMOUNT assures low over-all costs.

Leading manufacturers have widely adapted this latest conveying advance — both as integral equipment and as collecting conveyors for carrying material to a central disposal point. They want the uniform, continuous movement of materials . . . the long life offered by FLEXMOUNT. And they like its leakproof trough, compactness and low maintenance costs. It's a simple matter to build up any length desired in your shop from the stock length sections.

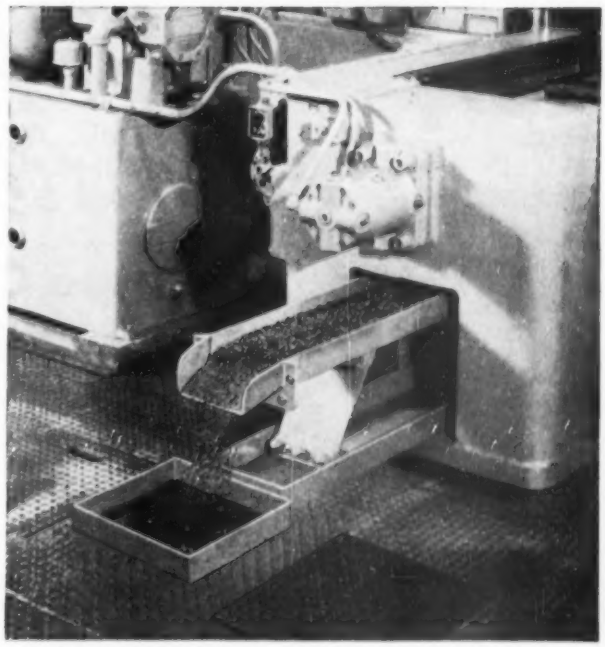
Easy-to-clean FLEXMOUNT Conveyors can be made dust-tight by the simple addition of a metal cover. For complete information, write for new Book 2478.

LINK-BELT

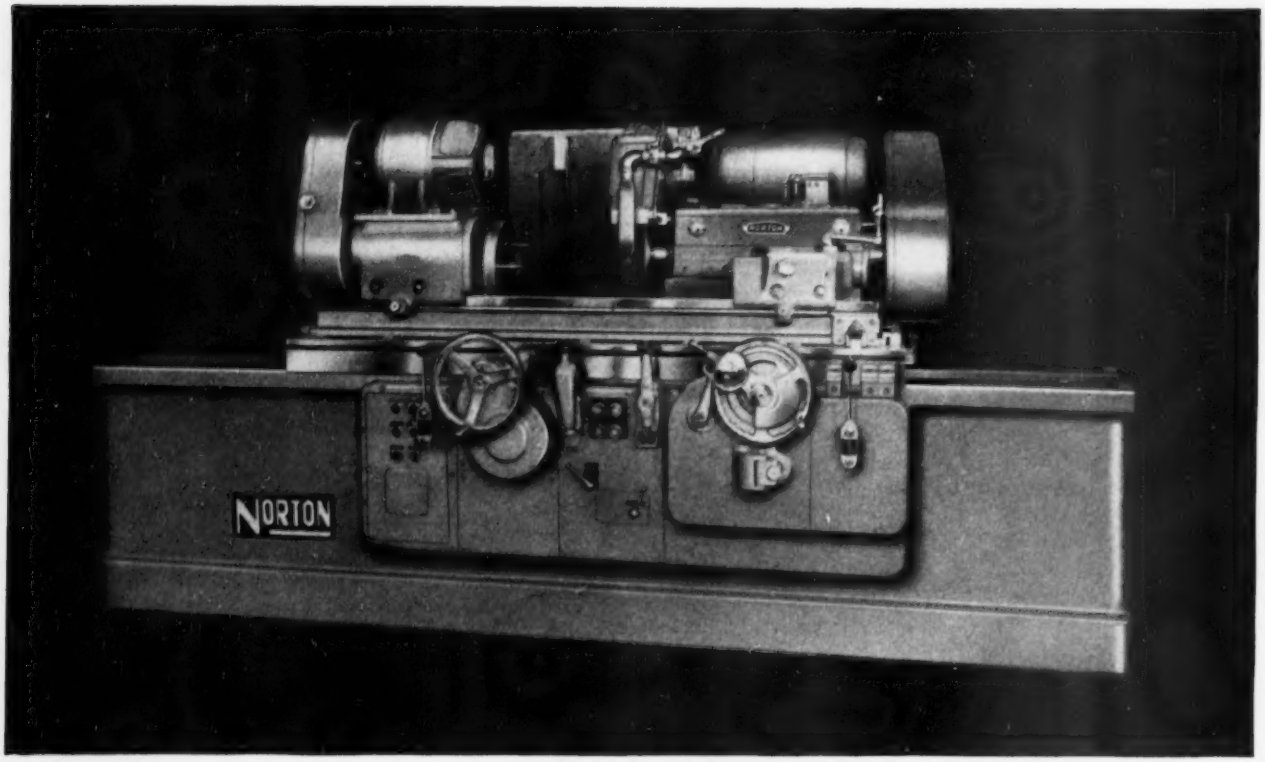
12,955 A

FLEXMOUNT OSCILLATING CONVEYORS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.



FLEXMOUNT Oscillating Conveyor built into an automatic transfer machine. Automotive plant that bought this machine tool also uses FLEXMOUNT for its chip collection system.



NORTON 10" TYPE CTU Semiautomatic Grinder is first choice on production lines and in job shops. No other cylindrical grinder offers you such a unique combination of speed, accuracy, flexibility and sturdiness. No wonder users have reported that Norton 10" CTU's have doubled production . . . replaced 2 or 3 machines . . . eliminated extra operations . . . made operators more productive. *Catalog No. 1787* gives you complete data about sizes, advantages, features and optional equipment that help you put extra profits into your production. It will pay you to look into the high-speed, high-finish grinding this machine makes possible.

You get better and faster cylindrical

with Norton Type CTU Semiautomatics

Heavy stock removal?
Consistently fine finishes?

You get either or both . . . easier and faster . . . with a Norton CTU Semiautomatic Cylindrical Grinder.

It's easy to see why. Your operator loads the work . . . *touches one lever* . . . and stands by while the machine does the rest . . . as easy as 1-2-3.

Work is automatically ground to size under electric timer control . . . and the wheel head resets itself for the next cycle.

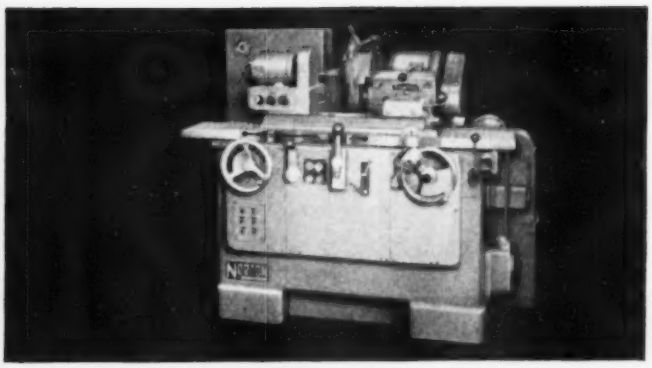
All three basic Norton CTU Semiautomatic Grinders: 4", 6", and 10", offer you the same advantages over their different ranges of work sizes. You can also get the 6" grinder with a 10" swing and the 10" grinder with a 14" swing by specifying Type LCTU. The Norton line of Type CTU Cylindrical Grinders also includes plain machines for traverse grinding. Your Norton Representative will be glad to help you choose the one that best fits your requirements.

Norton Cylindrical Grinding Machines are just one phase of *the world's most complete line of grinders and lappers* . . . products of Norton's engineering leadership in both grinding wheels and machines.

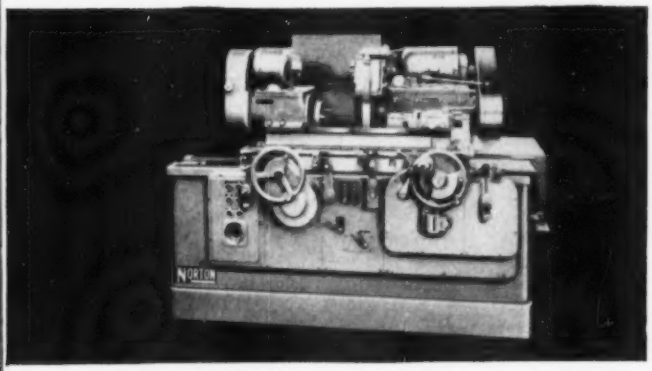
Remember — only Norton offers you such long experience in both grinding wheels and machines to help you produce more at lower cost.

Norton welcomes opportunities to work with you on the planning level to fit standard or special grinding machines into your plans for "post emergency" production.

For complete information, see your Norton Representative or write us direct for the catalogs listed under the machine illustrations. NORTON COMPANY, Machine Division, Worcester 6, Mass.



NEW NORTON 4" TYPE CTU Semiautomatic Grinder in 12" and 18" work length capacities now makes it practical for you to apply Type CTU high-speed, high-finish grinding to small parts. *Catalog No. 531* gives you full details.



NORTON 6" TYPE CTU Semiautomatic Grinder, in 18" and 30" work length capacities, has a performance record that's worth investigating. *Catalog 1488* tells the whole interesting story.

grinding

To Economize Modernize With NEW

NORTON

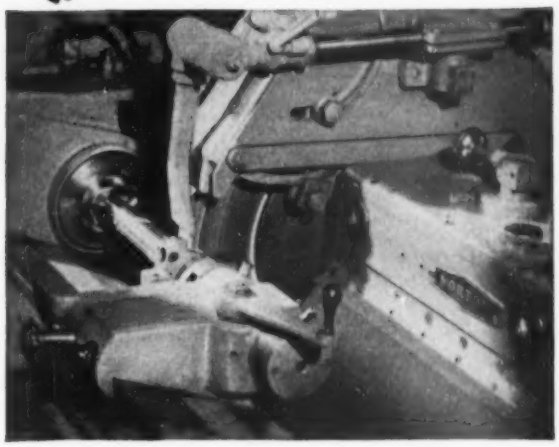
GRINDERS and LAPPERS

Making better products to make other products better

District Sales Offices: Hartford • New York • Cleveland • Chicago • Detroit
In Canada: J. H. Ryder Machinery Co., Ltd., Toronto 5

EASY AS 1-2-3

1. Operator loads machine and touches starting lever.

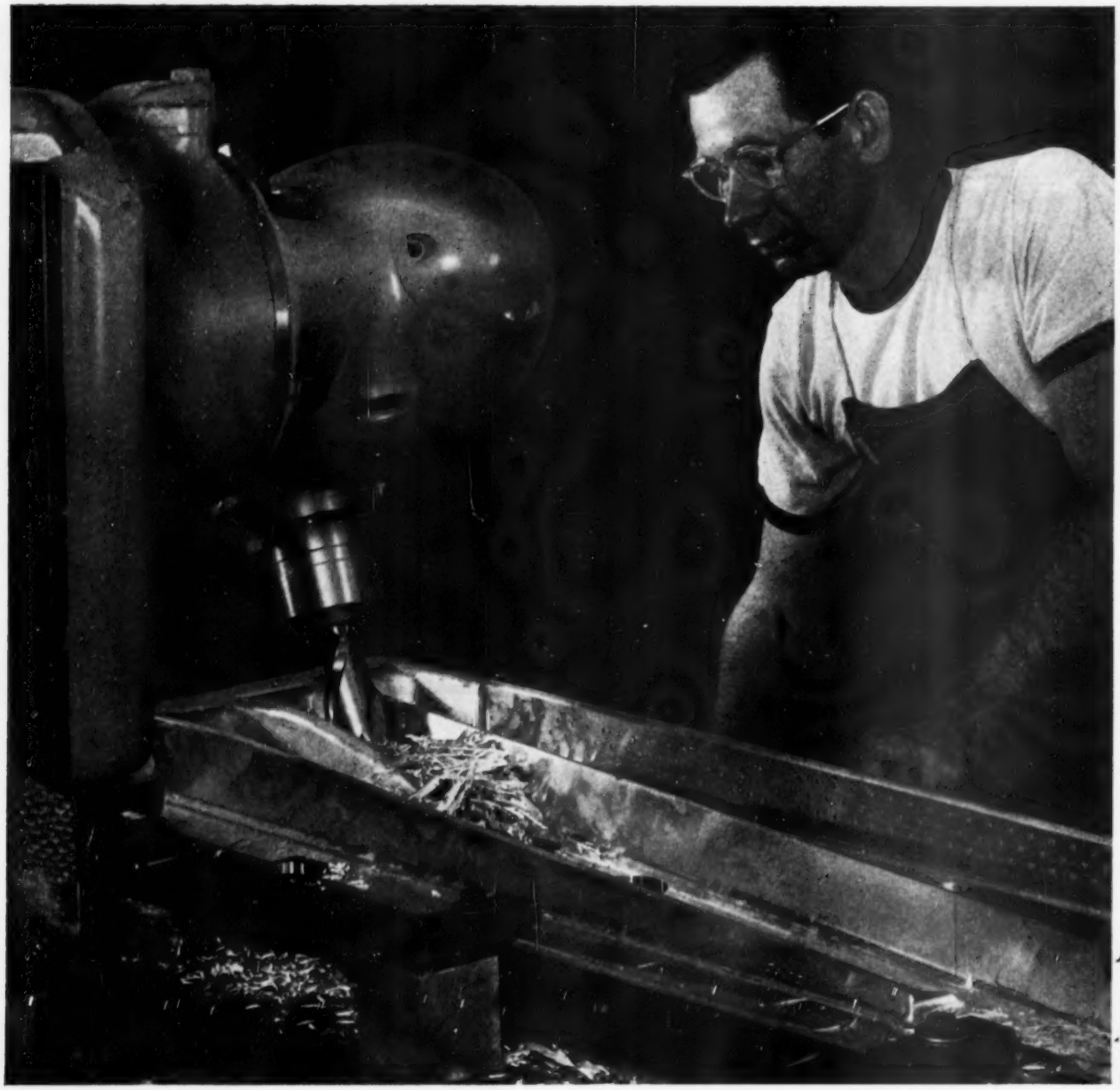


2. Machine automatically grinds part to required size and finish — while operator attends another machine.

3. Operator unloads machine.

KEARNEY & TRECKER MILWAUKEE

CK MILLING MACHINE OF STANDARD



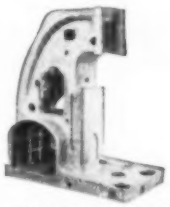
THE FACTS ON THIS JOB ARE: Machine: No. 6 — Model CK Plain (25hp) with heavy-duty universal Milling Attachment. **Part:** Large fusilage spar fitting — overall dimensions 39 1/16" x 17 3/4". **Material:** Aluminum Alloy 75ST (forging). **Tool:** 2-inch, 2-lip end-mill. (HSS). **Speed:** 265 rpm. **Feed:** 3 1/8 ipm.

Here's a typical example of how relatively inexpensive tooling greatly increases the versatility of Kearney & Trecker's new CK milling machines . . . producing a completed part every 6 minutes. Two operations were required for each part — (one) milling out the holes and recessing on the edges, then after changing the attachment setting and cutter — (two) finishing the inside (see photo).

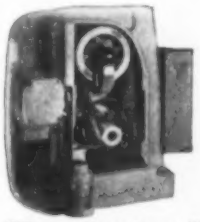
SPEEDS OUTPUT PRODUCTION PARTS

TEN ALUMINUM ALLOY 75ST (FORGING) AIRCRAFT SPARS PRODUCED EVERY HOUR FOR MAR VISTA ENGINEERING CO.

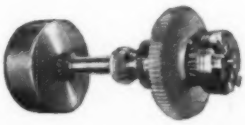
CK MILLING MACHINE FEATURES THAT HELP DO THIS JOB BETTER



Greater rigidity of new CK column easily absorbs vibration from heaviest cutting loads. Only single pass needed for each part.



New CK machines have Greater Horsepower. On this job, 25 hp permitted operator to get maximum work from his modern cutter.

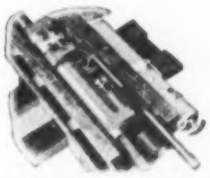


CK's 3-bearing spindle and flywheel assured Maximum Cutter Efficiency. On this job, it meant fast metal removal and excellent finish in a single pass.

The new Kearney & Trecker CK milling machine on this job has 24 different spindle speeds (13 to 1300 rpm). Its 32 different table feeds range from 3/8" to 90" per minute. Operator was able to pick proper *speed and feed* — to take full advantage of high horsepower and modern tools. The result — Greater Productivity on this job.

New 25hp No. 6 Model CK Plain

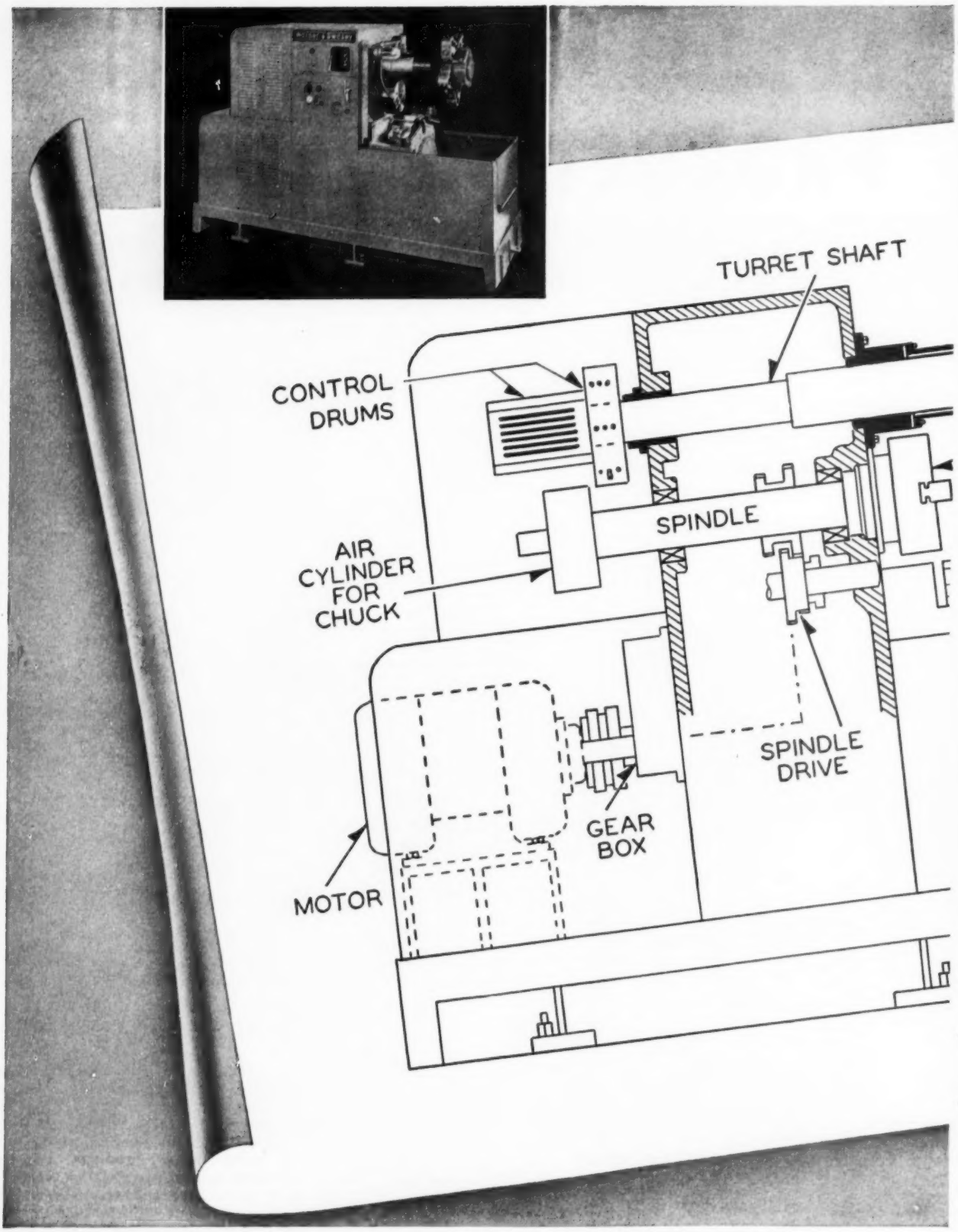
CK's new heavy duty (2" dia.) table feed screw gives greater bearing contact for smoother feed and sustained accuracy.



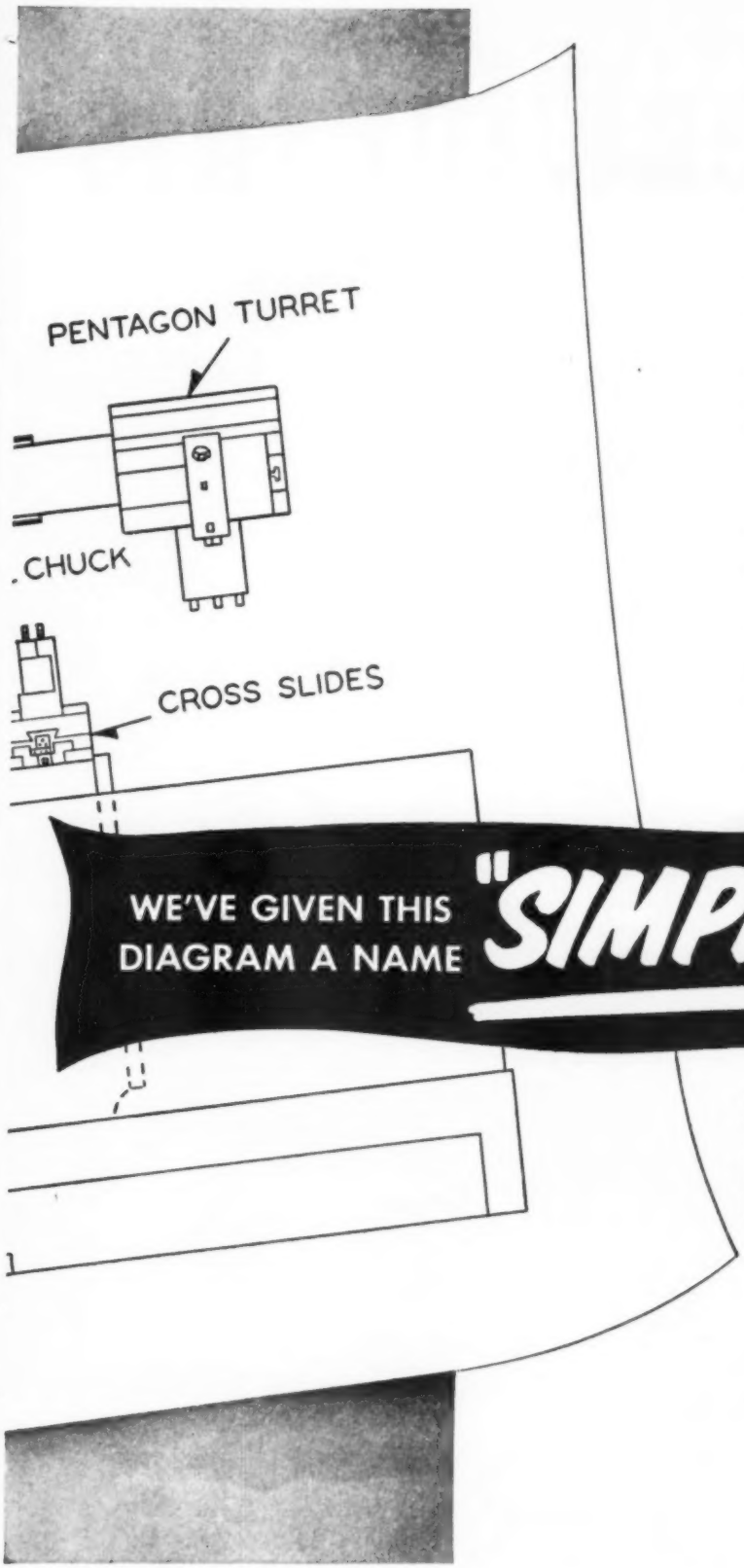
CK's positive lubrication plus generously proportioned gears and shafts assure cool, trouble-free operation under heaviest loads.

IT will pay you to see the new CK line of milling machines — check them against your own requirements. You'll notice how every feature is designed and job-proven to give you cost-cutting results — greater capacity, productivity and better finished products. For the full story, contact your nearest Kearney & Trecker representative or write: Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS



YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY



WE'VE GIVEN THIS DIAGRAM A NAME "SIMPLICITY!"

● We've labeled it "simplicity" because the machine it represents *is* so simple. Engineered simplicity is designed into the Warner & Swasey 1-AC Single Spindle Automatic Chucking Machine.

The 1-AC is simple and easy to set up . . . simple to tool, and simple to operate. There are no cams to change, and tooling stations are easy to get at. A wide range of speeds and feeds are readily available.

You get accurate, automatic machine operation on even small lot jobs that were never practical for automatic machines before.

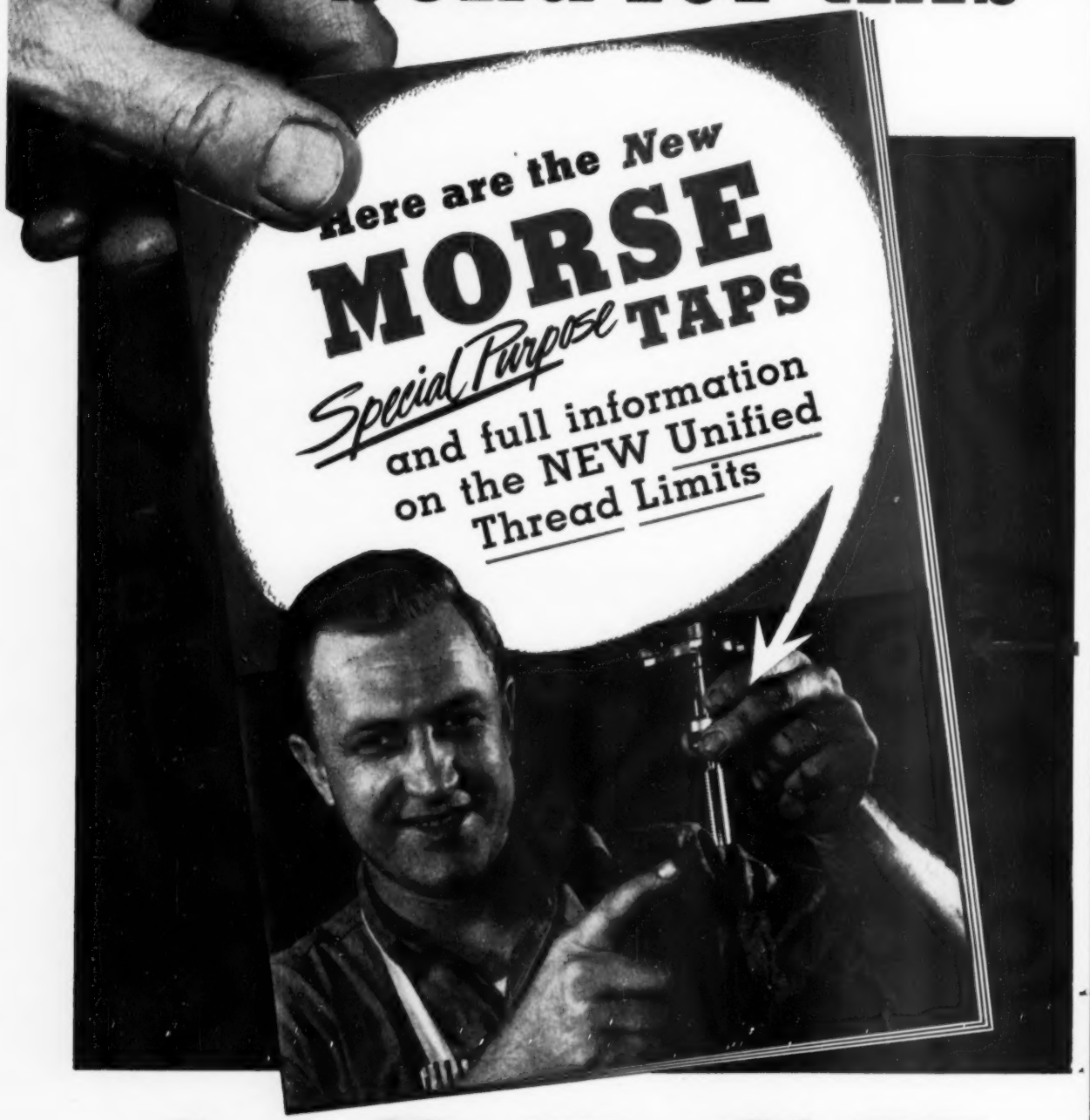
One man can operate two machines, turning out substantially more production than two men on hand operated machines . . . and with a large saving in setup time.

Certain machining jobs in your plant —even in small or medium lot runs— can undoubtedly be done faster, and with less manpower, with the 1-AC Automatic. To find out how this 1-AC fits into your production picture, call our Field Representative in your territory.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

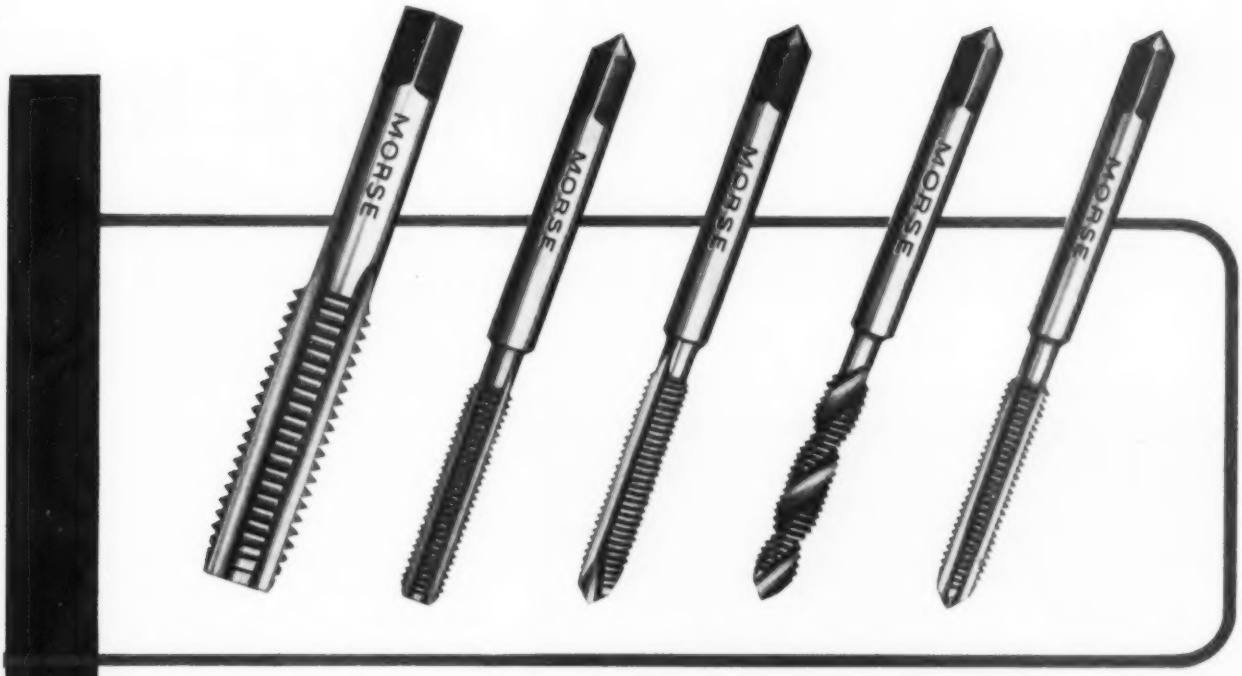
MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Send for this



MORSE

NEW BOOK Now...



Here's the *"book of the year"* for tap-users who want performance beyond anything they have known before . . . in cast iron or brass . . . in aluminum or stainless steel . . . and in non-ferrous materials with abrasive or shrinkable characteristics.

This handy, 12-page pocket-book gives complete specifications on the new line of Morse Special-Purpose Taps . . . and shows how they differ from Morse General-Purpose Taps in either rake or hook angle, or pitch diameter. What's more, you get the whole story, in 2 quick pages, on the new Unified Thread Limits.

First Edition Now on the Press . . . Write Dept. AM-1 and Reserve Your Copy NOW!

MORSE TWIST DRILL & MACHINE COMPANY
NEW BEDFORD, MASS.
(Division of VAN NORMAN CO.)
Warehouses in New York, Chicago, Detroit, Houston, San Francisco

Cutting Tools

. . . buy them by phone from your Morse-Franchised Distributor and save ordering time.

Research led to new concept in CINCINNATI Grinding Wheels

Cincinnati Milling has proved, beyond doubt, that the grinding process is a true metal cutting process. The grinding grits do not abrade or wear away the surface of a workpiece but form chips which agree in classification with the basic chip types found in other metal cutting processes.

This entirely new approach is not based on hasty conclusions. It represents 25 years of Cincinnati Milling research, coupled with practical experience in applying the basic fundamentals of grinding to a wide variety of work on both centerless and centertype machines.

TRUE VALUES of grinding wheel wear are obtained by instrument which gives consistent measurement of changes in wheel radius within .00005".

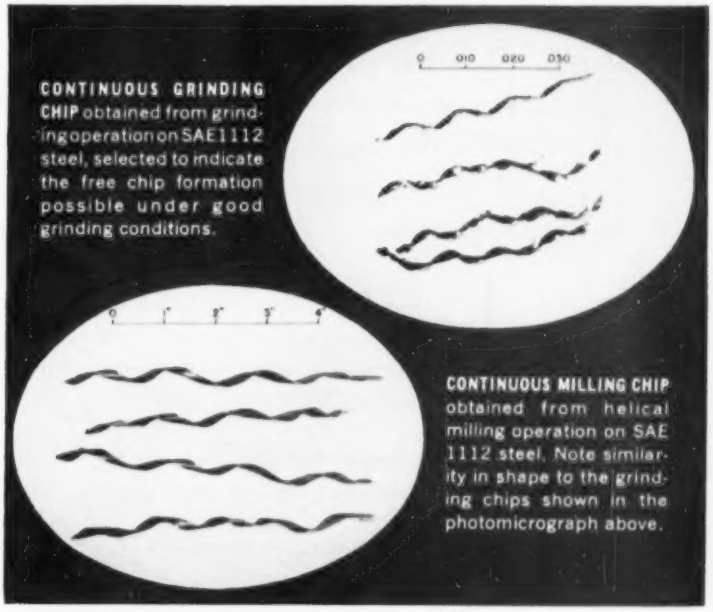
This new concept is the beginning of a new approach to grinding wheels—the development of the wheel as a true cutting tool. And it is a development you might expect from Cincinnati Milling, with the world's largest background of research and experience in metal cutting operations.

For you, this means grinding wheels developed and tested over a period of several years on the basis of true function—as true cutting tools forming true chips.

Available to you is a field organization of trained machinists who know grinding and grinding machines as well as grinding wheels. For a demonstration on your own machines of how to get the most out of Cincinnati Grinding Wheels, write, wire or phone Cincinnati Milling Products Division, The Cincinnati Milling Machine Co.

FREE BOOKLET. Now available to industry is a brand new booklet entitled "A New Concept In Grinding Wheels." It contains valuable information for everyone interested in grinding operations. For your free copy, just write Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

FAMOUS NAME is stenciled on a wheel that has passed a battery of tests and is ready for shipment to one of the ever increasing number of customers.



CONTINUOUS GRINDING CHIP obtained from grinding operation on SAE 1112 steel, selected to indicate the free chip formation possible under good grinding conditions.

CONTINUOUS MILLING CHIP obtained from helical milling operation on SAE 1112 steel. Note similarity in shape to the grinding chips shown in the photomicrograph above.

CINCINNATI
Grinding Wheels
THE CINCINNATI MILLING MACHINE CO.
Cincinnati 9, Ohio

Parts are manually loaded and automatically ejected for high production. Operator simply loads and starts the machine. Machine automatically reverses after down stroke.

The machine, fixture and broaches to broach the rifling grooves on recoilless shells are all American-engineered — typical example of complete American engineering from start to finish.

The MACHINE

A special T-10-36 American 3-Way — designed for the push down broaching of the shells past stationary broaches. The machine is equipped with dual electrical controls and is also arranged to allow the broached shell to eject automatically out the right hand side of the machine.

The FIXTURE

American engineers designed the lead bar attachment with driving lugs which contact the shell during the push down operation causing the shell to rotate during the broaching stroke.

The BROACHES

Individual cutters mounted in a pot incorporating the proper broach design to provide a free cutting operation as the shell is pushed through. These individual cutters can be easily removed for resharpening and replacement.

You can benefit from the American-Way when you want high production at low unit cost. Send a part print or sample for the recommendations of the company that *engineers and builds all three*—broaching machines, broaches and broaching fixtures. Write today. Address Dept. A.

AMERICAN

American BROACH & MACHINE CO.

A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

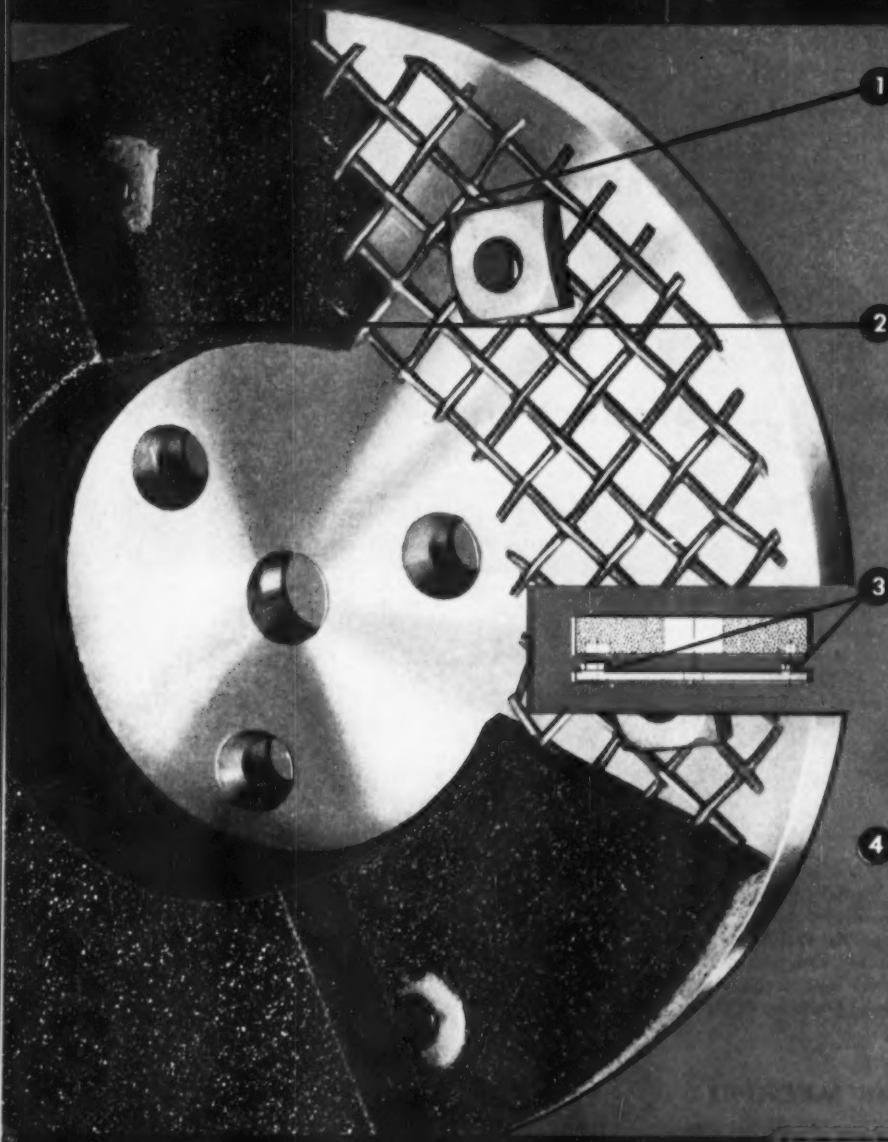
ANN ARBOR, MICHIGAN

SUNDSTRAND

See American First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

Compare the Exclusive Features

of This Abrasive Disc With Other Makes



1 WIRE-LOKT CONSTRUCTION
for positive safety

Heavy wire mesh is molded as an integral unit with abrasive. Provides maximum protection for operator.

2 JOB-FITTED ABRASIVES
at no extra cost

Abrasives compounded to fit needs when necessary. Production records permit exact duplication for reorders.

3 TRU-LOK DISC MOUNTING
for maximum precision

On GARDNER discs provided with the Tru-Lok feature, off-center mounting is impossible. Doweled Tru-Lok mounting aligns the holes in the abrasive disc and steel wheel exactly.

4 FIELD ENGINEERING SERVICE

A nation-wide service organization available to help you solve your flat surface grinding problems. Helps you obtain maximum efficiency and service from abrasive discs and equipment.

GARDNER
abrasive discs

Service Book Department
GARDNER MACHINE COMPANY
Beloit, Wisconsin 104A

Please send me a free copy of the Gardner Abrasive Disc Guidebook.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

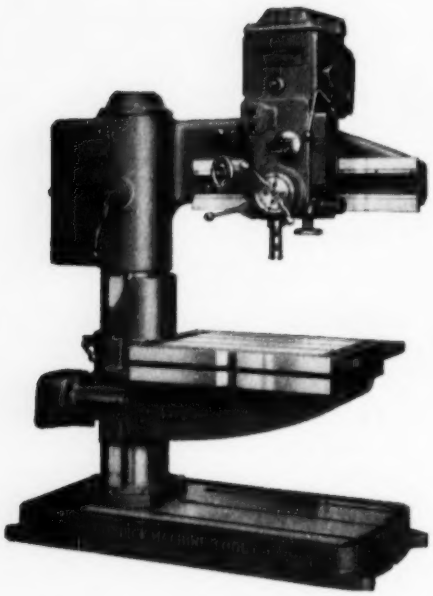
CITY_____ ZONE____ STATE____

FOSDICK

precision

positioned holes

production



SENSITIVE RADIAL DRILL

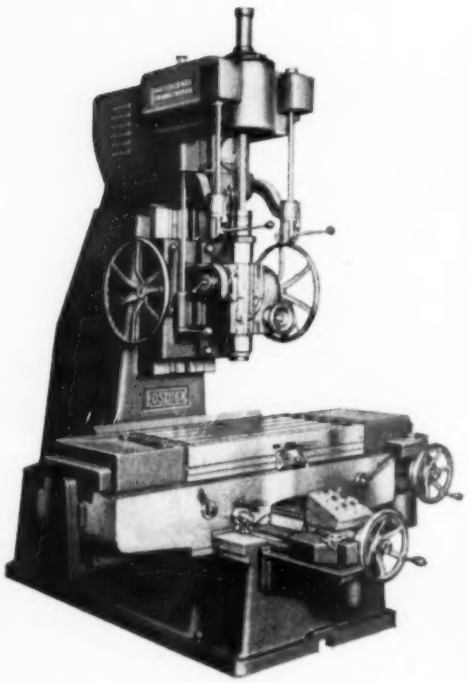
Exclusive with Fosdick, the Sensitive Radial combines upright and sensitive features—rigidity, compactness and convenient table height—with the capacity and flexibility of a radial. Table is universally adjustable, arm rotates at constant height and controls are always within convenient reach. One piece column, 3 and 4 ft. arms. Drills up to 1¼ ".

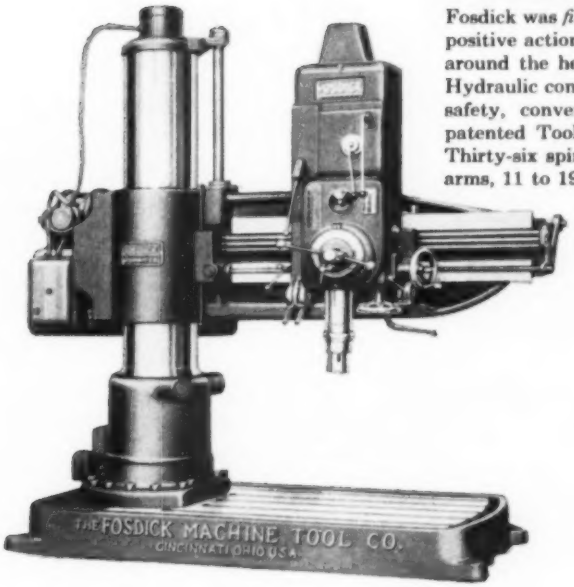
JIG BORER and AUTOMATIC POSITIONING MACHINE

Jig boring with automatic positioning has eliminated the need for highly-skilled labor for precision hole positioning! With duplicating bars—made quickly, stored easily—the ordinary operator can position table and slide at the same time to within plus or minus .0001" *at the touch of a button!* And Fosdick's Jig Borer costs less than any comparable machine on the market.

Duplicating drilled, bored and tapped parts—*weeks, months* or *years* apart—is fast, economical with Fosdick's Automatic Positioning machine. Set up time measured in minutes! Costly jigs are replaced by compact duplicating bars made of standard ⅝" stock, bored for each hole.

Table sizes: 18"x36" (no automatic positioning) and 22"x44". Table to spindle capacity, 27". 3 hp motor standard, 5 or 7½ hp optional.





ECONOMAX HYDRAULIC RADIAL DRILL

Fosdick was *first* to use hydraulics in a radial for smooth, positive action, easy operation. Controls are grouped around the head for maximum operator efficiency. Hydraulic controls and clamps are interlocked for safety, convenience. Standard equipment includes patented Tool Ejector and built-in fluorescent tube. Thirty-six spindle speeds, eighteen feeds. 3 to 8 ft. arms, 11 to 19 inch columns.

UPRIGHT DRILL

Two sizes, 25″ and 30″ with either round or box columns. Twelve spindle speeds from 60 to 1500 rpm, nine power feeds from .005″ to .043″ per revolution.

SENSITIVE DRILLS

For economical production of small drilled parts. 1 to 6 spindles in either six or nine speeds from as low as 55 rpm to as high as 3600 rpm, four power feeds.

Mail this coupon today!

FOSDICK

The Fosdick Machine Tool Co., Dept. A, Cincinnati 23

Please send descriptive bulletins for the following machines:

- ☐ *Sensitive Radial*
- ☐ *Automatic Positioning Machine*
- ☐ *Economax Radial*
- ☐ *Sensitive Drill*
- ☐ *Jig Borer*
- ☐ *Upright Drill*

Company

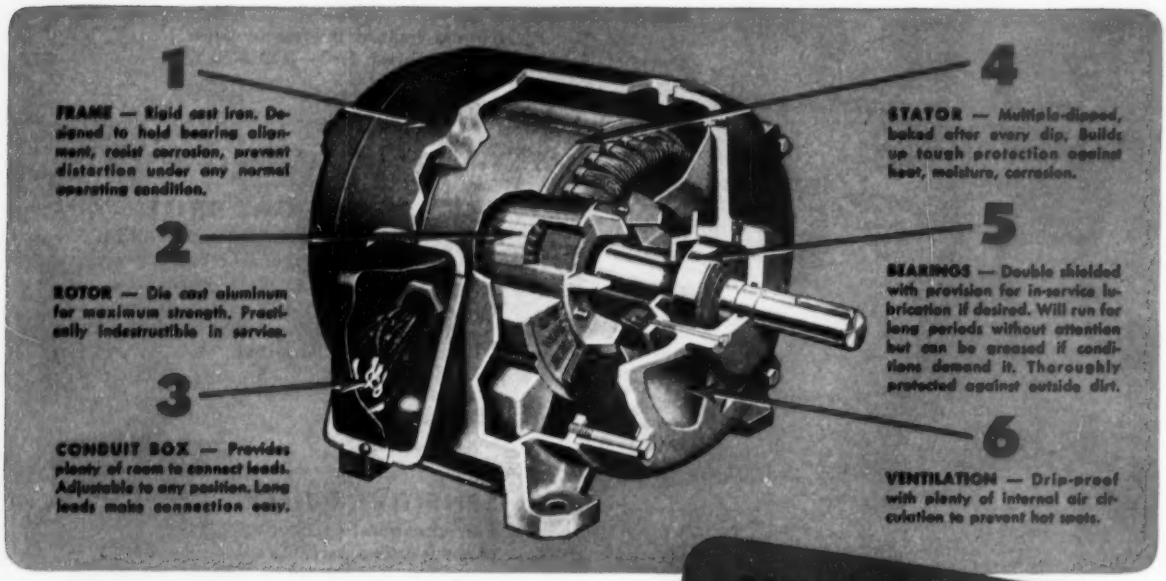
Address

Individual

Title

THE FOSDICK MACHINE TOOL CO., CINCINNATI 23, OHIO

Look for These 6 Signs of Good Motor Design


1
FRAME — Rigid cast iron. Designed to hold bearing alignment, resist corrosion, prevent distortion under any normal operating condition.
2
ROTOR — Die cast aluminum for maximum strength. Practically indestructible in service.
3
CONDUIT BOX — Provides plenty of room to connect leads. Adjustable to any position. Long leads make connection easy.
4
STATOR — Multiple-dipped, baked after every dip. Builds up tough protection against heat, moisture, corrosion.
5
BEARINGS — Double shielded with provision for in-service lubrication if desired. Will run for long periods without attention but can be greased if conditions demand it. Thoroughly protected against outside dirt.
6
VENTILATION — Drip-proof with plenty of internal air circulation to prevent hot spots.

Get Allis-Chalmers Motors for these Extra Values!

ALLIS-CHALMERS **MOTORS**

Certified Service — Nearly 100 Allis-Chalmers Certified Service Shops provide factory-approved parts and service on your Allis-Chalmers motors. Screened for modern equipment, adequate experience and business integrity, these independently owned service shops will provide you with prompt, economical repair and maintenance.

Complete Drives from One Source — Allis-Chalmers can supply your complete drive — motor, control and *Texrope* V-belt drive — from one convenient, reliable source.

Application Engineering — Your Allis-Chalmers District Office representative or Authorized Dealer will be glad to help you select exactly the right motors for your needs. For additional information, write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B6052. A-3954

Texrope is an Allis-Chalmers trademark.

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Distributors, Certified Service Shops and Sales Offices throughout the country.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE V-belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

PUMPS — Integral types from ¾ in. to 72 in. discharge and up.

ALLIS-CHALMERS

BULLARD

MANUFACTURERS OF MACHINE TOOLS

The Invisible Background of Industrial Progress

Lake Arrowhead, San Bernardino, California, is a winter sportsmen's paradise. It has been acclaimed the home of the National Orange Show and is famous for its scenic 101-mile drive on the rim of the world. Being accessible by modern, well-maintained roads and transportation facilities its natural beauty and recreational advantages can be enjoyed by more people than ever before. To facilitate year-round travel, Diesel motor graders as shown in the illustration clearing snow from the highway, keep the area open for winter sportsmen.

Many Bullard machines are employed for the manufacture of motorized equipment used for highway construction and maintenance, mechanical operations of orange groves and other agricultural enterprises. . . .

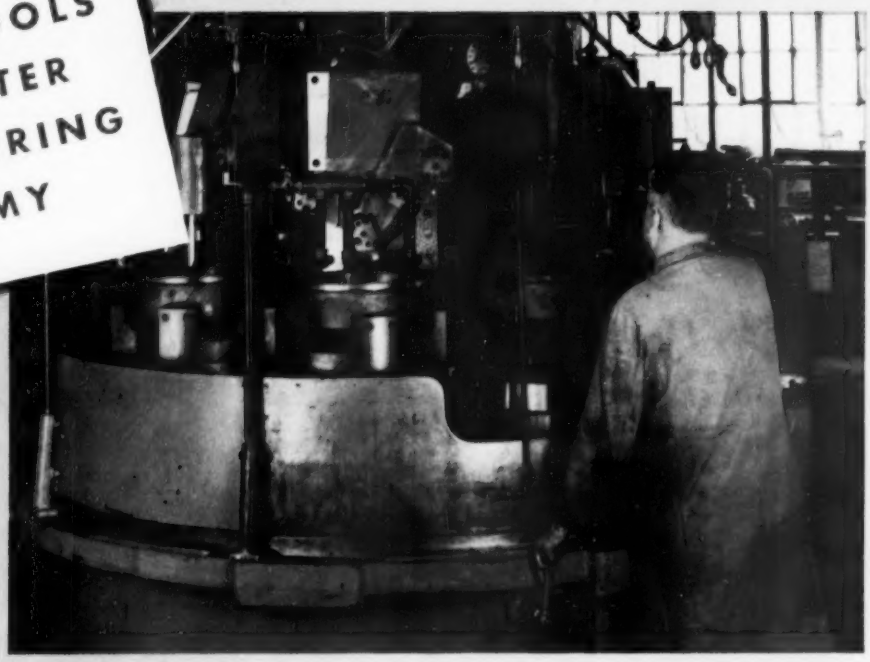
★ *Modern Machine Tools* are the key production machines for all American manufacturing plants. Motor manufacturers in particular have for many years recognized and relied on Bullard machines for their efficient, accurate and dependable production.

★ *For greater manufacturing economy* REFER *to next page*

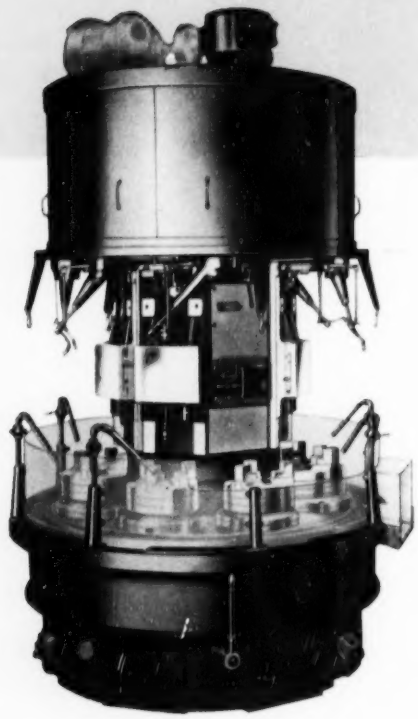
THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

BULLARD MACHINE TOOLS FOR GREATER MANUFACTURING ECONOMY



A Mult-Au-Matic on production of heavy Brake Drums. Mult-Au-Matic's versatility makes it adaptable to many types of tooling for many different classes of work.



For many years Mult-Au-Matics have been considered versatile production units whether they were on shorter runs or mass production of identical parts.

From its early adoption in the pleasure car manufacturing industry up to the present time in the manufacture of parts for tractors, airplane engines, electric motors and many other classes of work too numerous to mention, the Mult-Au-Matic has set an important economical manufacturing pace for peacetime as well as defense requirements.

Let Bullard engineers submit surveys on your regular run of work or the more difficult problem jobs.

BULLARD

Time saved is money earned. Write now for information.

THE BULLARD COMPANY BRIDGEPORT 2, CONNECTICUT

Industry's Newest Cost Cutting Method: Hydroforming

CINCINNATI 26" HYDROFORM
Also built in 12", 19", 23" and 32" standard sizes. Machine size indicates maximum blank diameter that can be formed. Material thickness can range from foils to ⅜" steel. Bulletin M-1759-1 gives data on the Hydroforming process as well as machine specifications. Write for your copy.

Hydroforming has given industry an improved, *simplified* deep drawing process. Parts can be drawn of more intricate shape — having improved mechanical and physical values — in far fewer operations than common practice allows.

Tool costs run as low as 10% of conventional die set costs, making short-run production exceptionally economical. Trial parts are quickly produced. Tools can be readily modified to suit changes in part design. Different gages and types of materials can be tried, drawn on the same set of tools.

Hydroform tooling consists of the simplest elements of conventional tooling—a male punch and one draw ring. A built-in universal die member takes the place of the female die and the other parts of conventional tooling. Sheet materials, held between the punch and the universal die, are formed to the shape of the punch by *controlled* hydraulic pressure.

Investigate Hydroforming for your production. It will change your thinking on deep drawing and forming. The Cincinnati Milling Machine Company representative in your area will gladly give you detailed information. In addition, at the "Mill" in Cincinnati, a Hydroform laboratory is maintained where runs of sample parts are produced and where this revolutionary deep drawing principle can be demonstrated most effectively. Interested manufacturers are invited to inspect these facilities.

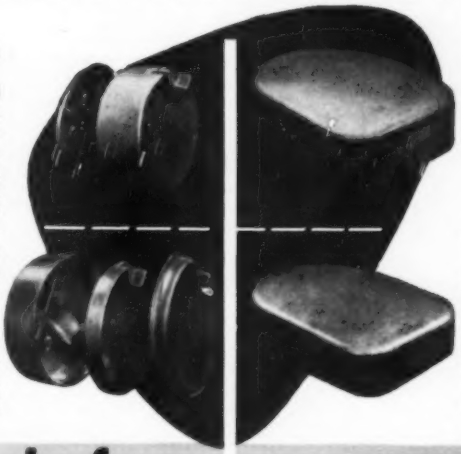
HERE'S WHAT HAPPENS WHEN HYDROFORMING ENTERS THE PRODUCTION PICTURE

ELECTRONIC INSTRUMENT CASE
0.040" Aluminum
FORMER METHOD Deep Drawn and Fabricated
12 Operations Total

Photo shows, in sequence form, the operations formerly required to produce this part. The shallow cover was drawn in 1 operation; the body required 2 draws, to sharpen the inside radius. The body was then notched to receive a plug receptacle, which was hand fabricated and welded in place.

HYDROFORM METHOD Deep Drawn
7 Operations Total

By re-designing the part to take advantage of Hydroforming capabilities, the part that was previously the cover became the body, produced complete with locating edge in 1 forming operation on a 12" Hydroform machine. The cover, with plug receptacle as an integral part, was formed in 2 operations.



GEAR CASE COVER, 16 ga. Steel
FORMER METHOD Fabricated
8 Operations Total

Previously produced, as photographed, in 2 sections, formed on a press brake. The sections were welded, ground and polished to remove excess weld material and re-shaped to fit the area to be covered.

HYDROFORM METHOD Deep Drawn
3 Operations Total

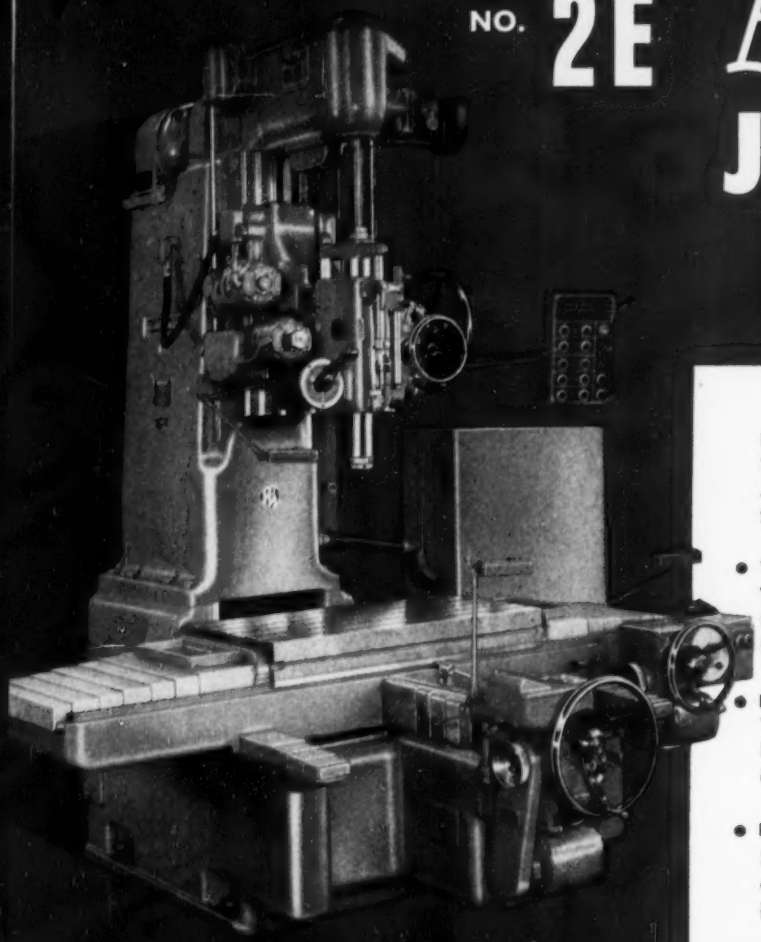
The part is now Hydroformed complete in 1 draw, then trimmed. The photo at top of page shows the part being drawn on the 26" Hydroform. The saving in fabrication time alone paid for the cost of tools used to Hydroform this part, although less than 300 of these covers are required per year. The Hydroformed covers are held to close tolerance, eliminating a fitting problem that existed when these parts were fabricated.

CINCINNATI **Hydroform**

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.

THE NEW PRATT & WHITNEY NO. 2E *Electrolimit* JIG BORER

THE PRACTICAL SIZE FOR THE AVERAGE TOOL ROOM



BRINGING THESE OUTSTANDING ADVANTAGES OF THE PRATT & WHITNEY SERIES "E" *ELECTROLIMIT* JIG BORERS TO YOUR MANY SMALL AND MEDIUM SIZED, HIGH-PRECISION JOBS

- **THE NEW P&W *Electrolimit* MEASURING SYSTEM**
  This entirely new method of locating the table is extremely fast, accurate and easy to use. Wear is eliminated and the high original precision is retained indefinitely.

- **EXCLUSIVE PRECISION PRELOADED BALL ROLL QUILL**
  The hardened, ground and lapped spindle quill "roll-feeds" in a preloaded ball roll mounting. Accuracy to "tenths" is assured indefinitely without maintenance or adjustment.

- **P&W OPEN SIDE CONSTRUCTION**
  Large, irregular shaped work pieces are handled with a convenience and speed impossible with any other type of jig borer construction.

- **AMPLE CAPACITY**
  Table working surface is 22" x 44", longitudinal travel 36" and transverse travel 22". Table top to spindle end, maximum, is 27"; special columns 6" and 10" higher than standard can also be supplied.

Other PRATT & WHITNEY *Electrolimit* JIG BORERS

NOW IN PRODUCTION:

THE 1E Compact and versatile with table sizes of 12" x 24" and 12" x 42".

THE 4E Largest precision jig borer built with 36" x 72" rectangular table or combination rectangular and built-in 48" rotary table.

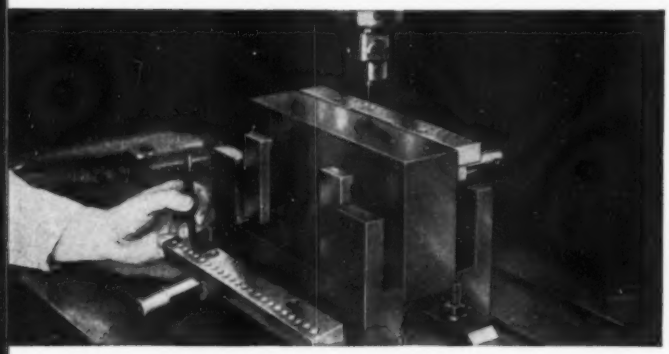
AND ON THE WAY:

THE 3E Intermediate capacity with a 28" x 56" table.

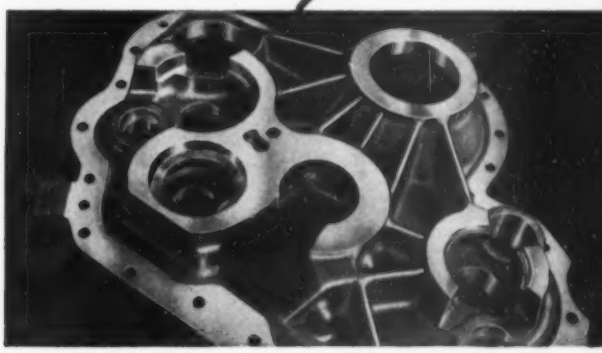
Machining of components for this big die, 48" square, is handled with a P&W 20" Rotary Table on a Pratt & Whitney Jig Borer. A total of 160 holes on the die ring and punch pad are drilled and bored to a tolerance of ±.0001" making possible a uniform fit in any combination of assembly.

Here a casting is precision machined on a P&W Jig Borer with a P&W Tilting Rotary Table. Using only ordinary hold-down clamps, 13 holes are bored, 2 surfaces faced and 3 more surfaces precision milled *in a single setup*. No special fixtures are required.

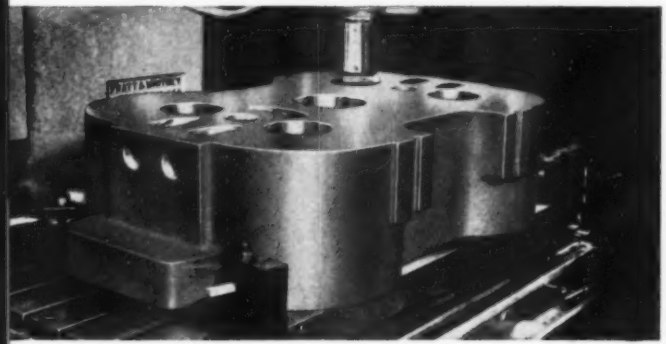
YOU CAN PUT *Performance like this* TO WORK IN *Your Plant*



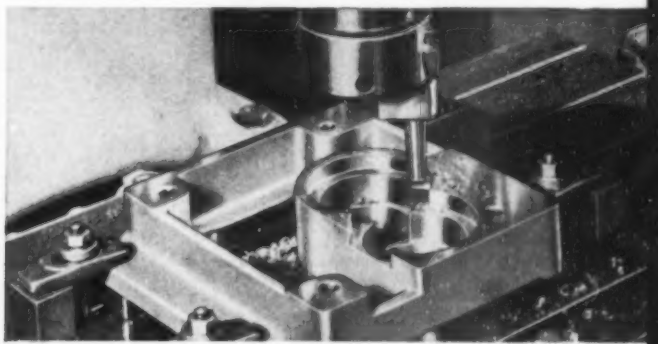
One of these punch and die bars requires 23 holes .1875" in diameter; the other requires 23 holes .3120" in diameter. Using a P&W Jig Borer, they are all single point bored to a tolerance of +.0000", —.0002"; center distances of .5000", ±.0002" and a permissible accumulated error of only ±.0005"



Extreme, dependable accuracy is a "must" in the Aviation Industry. That's why a Pratt & Whitney Jig Borer is used to machine the aluminum alloy aircraft engine part to "tenths" limits. Operations include drilling, boring, facing and precision milling.



Machining this big Meehanite casting for a hydraulic pump, calls for five holes approximately 5" in diameter, precision bored to a tolerance of .0005" for spacing and hole size. A Pratt & Whitney Jig Borer does the job rapidly, dependably, economically.



Shown here is a single point boring operation on one of the four overlapping holes in a machine gear box adapter. The four diameters in each of these two bearing seats are precision bored to a tolerance of .0005" using a Pratt & Whitney Jig Borer.

Write on your Company letterhead for Cir. No. 559.

PRATT & WHITNEY
DIVISION NILES-BEMENT-POND COMPANY
WEST HARTFORD 1, CONNECTICUT, U. S. A.

First Choice for Accuracy

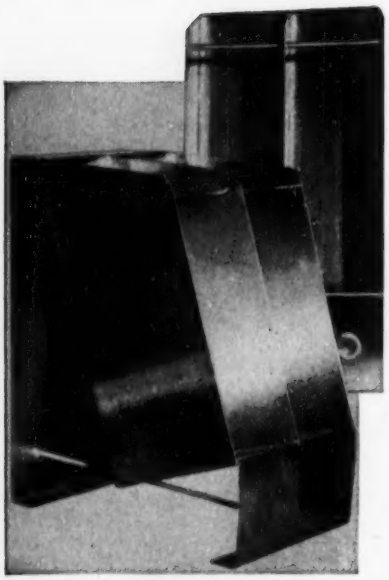
MACHINE TOOLS • CUTTING TOOLS • GAGES

SOME ANSWERS

TO YOUR SHOP QUESTIONS

ON forming STRAIGHT-CHROMIUM STAINLESS STEELS

This is one of a series of advertisements discussing the straight-chromium grades of Stainless Steel from the standpoint of fabricating performance. Other operations that will be considered are machining, cutting, deep drawing, spinning, welding and finishing.



Formed from
U·S·S 17 (Type 430) Stainless Steel

These utensil racks were fabricated from 16 gage sheets and ⅛" rods of U·S·S 17 (Type 430) Stainless Steel by Purity Manufacturing Company, Cattaraugus, N. Y. Forming was done on a press brake and bends exceeding 90° were accomplished without difficulty. Other fabricating operations included argon and spot welding and grinding.

Purity Manufacturing turned to straight-chromium fabrication more than a year ago, after years of specialization on dairy industry equipment of nickel-bearing Stainless Steel. They have encountered no difficulty in fabrication.

OF the Stainless Steels available today, straight-chromium grades—and especially U·S·S 17 (Type 430)—offer you the widest possibilities in fabrication and end use.

Press and brake forming of sheet and strip are among the most common shop operations encountered in working these grades. Here are a few facts to keep in mind for such operations in order to get the maximum performance from straight-chromium grades.

Type 430 Stainless Steel has a lower tensile strength than the nickel-bearing grades. This permits it to be formed on tools that have less power available than those used for nickel-bearing grades. Forming tools rated at a definite capacity for carbon steels are suitable for straight-chromium Stainless Steels of approximately the same thickness.

Although additional steps or operations may be required, fabricators who have worked with straight-chromium grades generally report that almost anything that can be made from nickel-bearing Stainless Steel can also be formed from straight-chromium grades.

In planning and layout, take into consideration the fact that Type 430 possesses directional properties. As a result, it is sensitive to longitudinal breaking in the course of lock seaming and bending. Additional steps or operations will offset this tendency.

In every case it will pay you to consult with our representatives concerning these grades. They will examine the job from the standpoints of both end use and shop equipment and give you their recommendations.

WRITE FOR OUR FREE BOOK

You'll find the full story on working characteristics of the straight-chromium grades of U·S·S Stainless Steel, as well as nickel-bearing grades, in our book "Fabrication of U·S·S Stainless and Heat Resisting Steels." For your copy, write to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S STAINLESS STEEL

USS

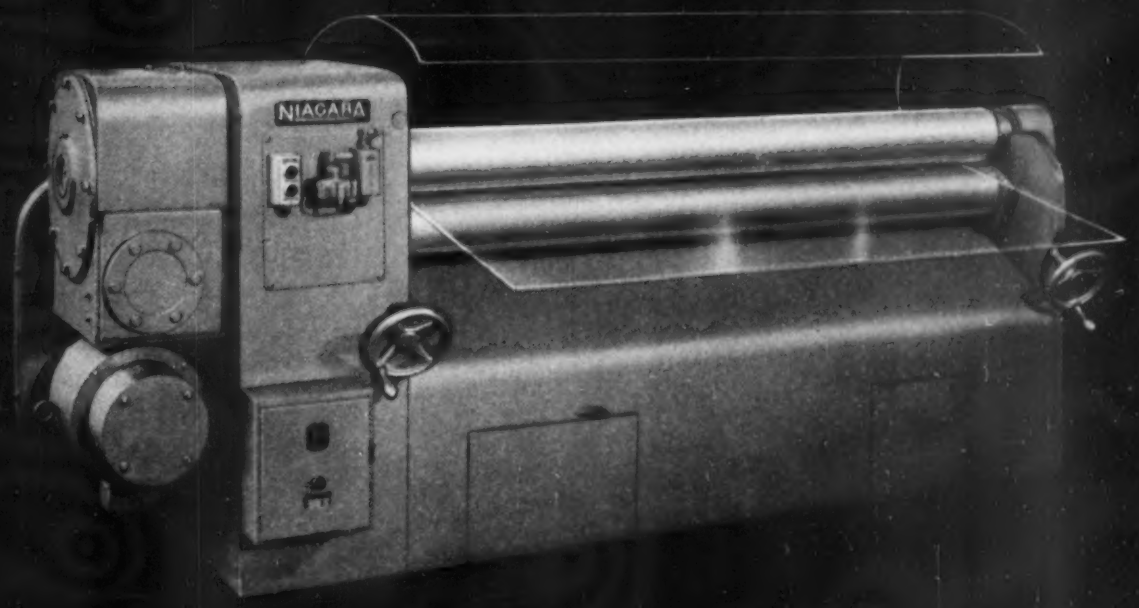
SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

3-49

UNITED STATES STEEL

NIAGARA

ANNOUNCES



new all steel BENDING ROLLS

- Produces commercially true cylinders from thinnest sheets to maximum capacity.
- Rolls a multitude of bends in various shapes including oval forms, rectangular pipes, rounded end containers, cones etc.
- Pinch-type construction materially reduces flat spots on leading and trailing edges of work.
- All three rolls power driven permitting smaller diameters and easy operation with light gage sheets.
- Air operated drop end automatically tilts upper roll for easy removal of rolled cylinder.
- Power adjustment for rear roll saves time and effort.
- Roll position indicators allow operator to quickly duplicate roll settings for repeat jobs.
- Rapid reversal and positive jogging of rolls gives operator accurate control at all times.
- Magnetic brake on main motor prevents "drifting" of work, enabling operator to do accurate work without guessing.
- Unbreakable steel construction.
- No special foundation required.

6" Roll Series
Capacities 5/16"x 48";
3/16"x 72" and 12 ga x 120"

Write for new Bulletin 88

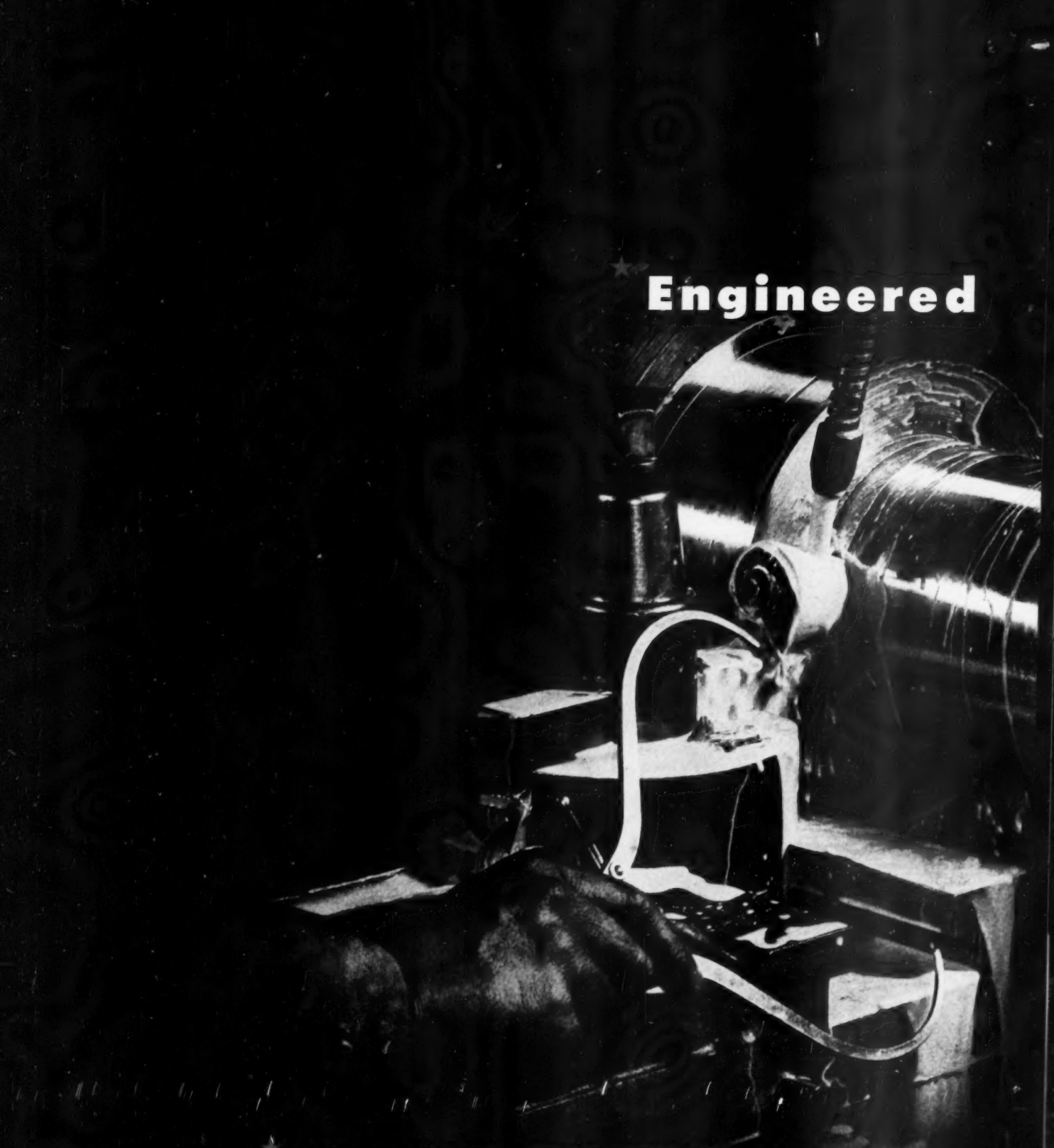
NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

America's Most Complete Line of Presses, Shears, Machines and Tools for Sheet Metal Work

DISTRICT OFFICES: DETROIT • CLEVELAND • NEW YORK • PHILADELPHIA

Dealers in principal U. S. cities and major foreign countries

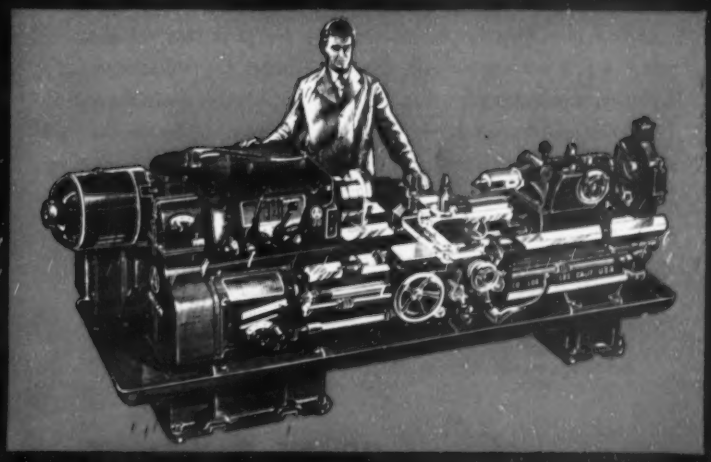
Engineered



Axelson manufactures heavy duty engine lathes in 16", 20", 25", and 32" sizes of various lengths; precision tool room lathes; a 20" medium duty engine lathe; gap lathes.

for the tough jobs, too!

From the heaviest roughing cut down to the finest precision cut Axelson lathes are designed and manufactured to give precise, accurate service. Critical dimensions "stay put" because each Axelson lathe part is produced under strict metallurgical control. Recording pyrometers keep continuous time and temperature records of hardening, tempering and normalizing operations on gears, spindles, shafts, lead screws, etc. Quality built, Axelson lathes are capable of delivering dependable, accurate work under the most difficult operating conditions.



AXELSON Lathes

PSC

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

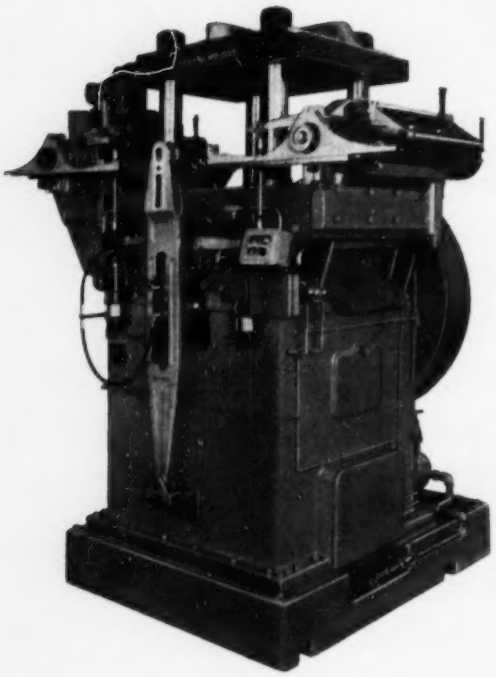
CHOSEN FIRST . . . . TO LAST!

TOOL ROOM LATHES • GAP BED LATHES • HEAVY DUTY ENGINE LATHES

AXELSON MANUFACTURING COMPANY • Division of Pressed Steel Car Company, Inc. • Los Angeles 58 • New York 7 • St. Louis 16

Authorized Distributors in All Principal Industrial Centers

A PROFIT WITH EVERY STROKE



Our customers say that. It figures. One Dieing Machine does the work of five to ten conventional stamping presses. One stroke—a complete part. One inspection. One trip for parts removal. Speed—you can pull out the throttle. Die life—longer for two reasons. (1) Stability, minimum vibration, extreme precision of tools alignment. (2) Dies take less of a beating; less metal needs to be removed for sharpening. Our men can give you the whole Dieing Machine story. If you want to cut costs, now's the time to talk to one of them—a note from you will have an H & W man on deck promptly.

NEW CATALOG Up-to-the-minute facts on Dieing Machines. Capacities now range from 25 tons to 2500 tons. Catalog gives specifications up to 400-ton machine. Write Henry & Wright, 481 Windsor St., Hartford, Connecticut.

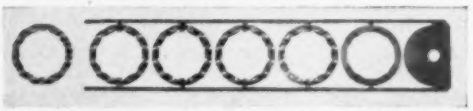
HENRY & WRIGHT

DIVISION OF EMHART MFG. CO.

HARTFORD 1, CONNECTICUT

TYPICAL JOBS THAT SHOW A PROFIT AT EVERY STROKE

Automotive stamping produced complete per stroke from 3/32" thick by 13" wide hot rolled steel in coils on 200-ton Dieing Machine, single gear type, equipped with progressive die. Speed approximately 45 strokes per minute.

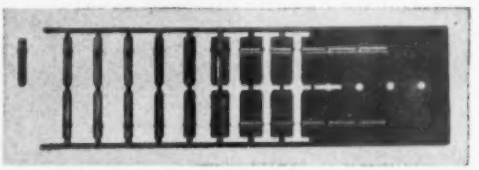


Ball bearing retainer produced complete in 75-ton Dieing Machine operating at speed of 95 strokes per minute. Made from 4⅛" wide by .034" thick cold rolled steel.

Ferrule. One completed piece produced per stroke in 50-ton Dieing Machine operating at speed of 90 strokes per minute. Made from 5/16" diameter by ⅞" long by .030" thick cold rolled steel.

C-Clamp Frame. Both halves produced complete in 150-ton Dieing Machine operating at speed of 65 strokes per minute. Material—cold rolled steel .086" by 4⅛" wide.

Support bracket produced complete one per stroke in 150-ton Dieing Machine operating at speed of 60 strokes per minute. Made from .062" thick by 7¼" wide cold rolled steel.



Radio tube prong produced complete in 25-ton Dieing Machine at rate of 450 pieces per minute. Made from brass .012" by 1 7/16" wide.

Bathroom fixture produced in 60-ton Dieing Machine operating at speed of 100 strokes per minute. Made from .032" thick by 1¾" wide cold rolled steel.

Hardware item. One completed piece produced per stroke in 100-ton Dieing Machine operating at speed of 75 strokes per minute. Made from 3" wide by .040" thick cold rolled steel.

No turret
cams to change
on New Britain's new
Single Spindle
Automatic.

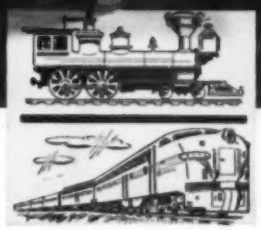
Machines for Making Progress

TODAY'S improvements in transportation make front page news. Behind every such advance is a similar improvement in the machines that turn out the products which go into each plane or train or motor car. Without better machines, progress would slow down to a walk.

On this page are three ultra modern machines vital to the plants where manufacturing history is being made. Are your machines this modern? If not, can you afford to do without the production speed and economy they make possible?

Model 601 Multiple Spindle Automatic Screw Machine is the most advanced tool for multiple operations on bar stock up to 1¼". This six-spindle machine is massive and powered for tough forming steel jobs. Designed for

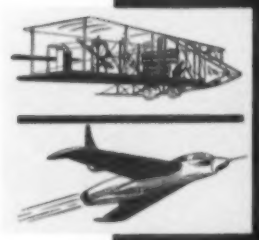
AUTOMATIC BAR
LUCAS H



super-high spindle speeds essential for brass and aluminum. A cross slide in each position. Actuated by disc-type cams directly behind the slide. Exclusive features permit quick setups where short runs are the rule.

New Britain Precision Boring Machines include models for both straight or contour boring and turning. They are simple in design, and their cam controlled slides enable them to positively repeat from piece to piece, holding size to within .0001, with spindle speeds up to 7300 r.p.m. High production and great versatility are assured by such features as two-speed drive, rapid traverse, optional automatic loading device and optional vertical cross slide. Additional spindles may be mounted if the type and size of the job permits it. A double-end model is also available.

New Britain Model 126, a completely new approach to single spindle metal turning. Simple cross slide cams which can be preset have been specifically designed to reduce down time. Feed and speed changes automatically controlled from program drum. The Model 126 can be readily and quickly set up by the operator, and is adaptable to a variety of work jobs involving either long or short runs.

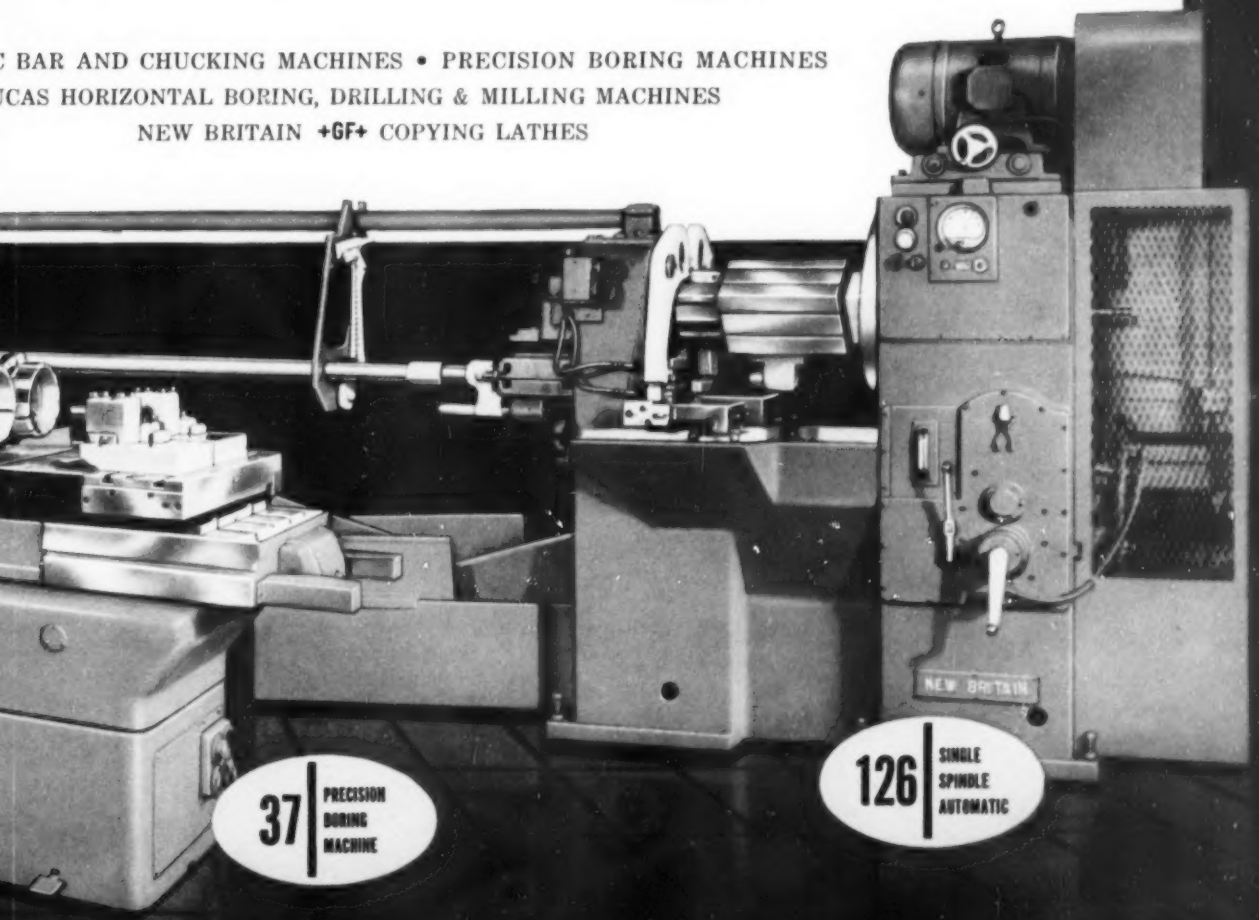


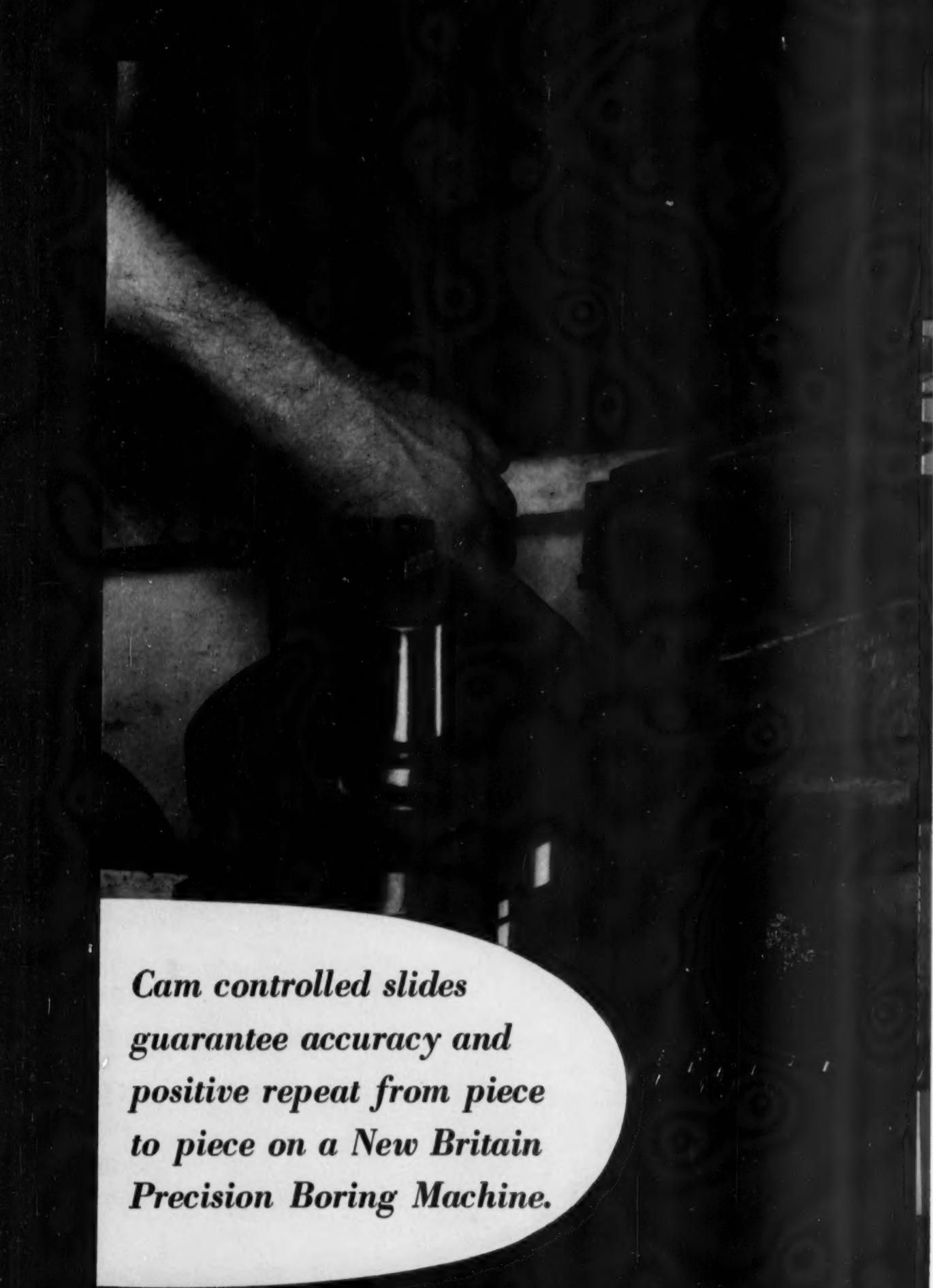
THE NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division
New Britain, Connecticut

Lucas Machine Division
Cleveland 8, Ohio

BAR AND CHUCKING MACHINES • PRECISION BORING MACHINES
UCAS HORIZONTAL BORING, DRILLING & MILLING MACHINES
NEW BRITAIN +GF+ COPYING LATHES





Cam controlled slides guarantee accuracy and positive repeat from piece to piece on a New Britain Precision Boring Machine.

"Indispensable for Tool Rooms and for Production Departments when Extreme Accuracy is required"

HARDINGE
ELMIRA, N.Y.

LATHES • MILLING MACHINES • CHUCKING MACHINES • SECOND OPERATING MACHINES

185 Stock Pumps

that make precise selection easy

FOR HYDRAULIC SERVICE, COOLANT, LUBRICATION, AND MISC. INDUSTRIAL USES

Knowledge of the complete line of Brown & Sharpe Pumps can be a valuable asset to you. It will save you time and money on many design jobs calling for smooth, quiet pump operation . . . and extended pump life without maintenance troubles. Most often, you'll find just the pump you need among the 185 stock models . . . centrifugal, geared, reversing vane . . . direct or motor-driven. If a special pump is required, however, you can depend on Brown & Sharpe engineers to design it to meet your requirements.

Complete, illustrated information on each type and size is available in the big Brown & Sharpe Pump Catalog. It includes all data, installation dimensions, and charts showing performance characteristics. Write for your copy. Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

WE URGE BUYING THROUGH THE DISTRIBUTOR

Brown & Sharpe B·S

SPRINGFIELD LATHES

PROGRESS has been the "by-word" at Springfield for more than 64 years.

CONTINUED PROGRESS, based on this experience, keeps Springfield in the lead.

BUY SPRINGFIELD for the latest in design, construction and performance
BUY SPRINGFIELD . . . . . for accuracy, speed, stamina, versatility

THE SPRINGFIELD MACHINE TOOL COMPANY
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EXCLUSIVE REPRESENTATIVES IN ALL PRINCIPAL CITIES

Lowering the Cost of Tapped Holes: THE PRINCIPLE OF BALANCED *Action*

It saves money by giving you consistently accurate work, *minimizing scrap losses.* It saves money by giving you *longer tool life.*

WINTER BROTHERS COMPANY
Rochester, Mich., U.S.A.

Distributors in principal cities. Branches in New York, Detroit, Chicago, Dallas, San Francisco. Division of National Twist Drill & Tool Co.

ALWAYS AT YOUR SERVICE

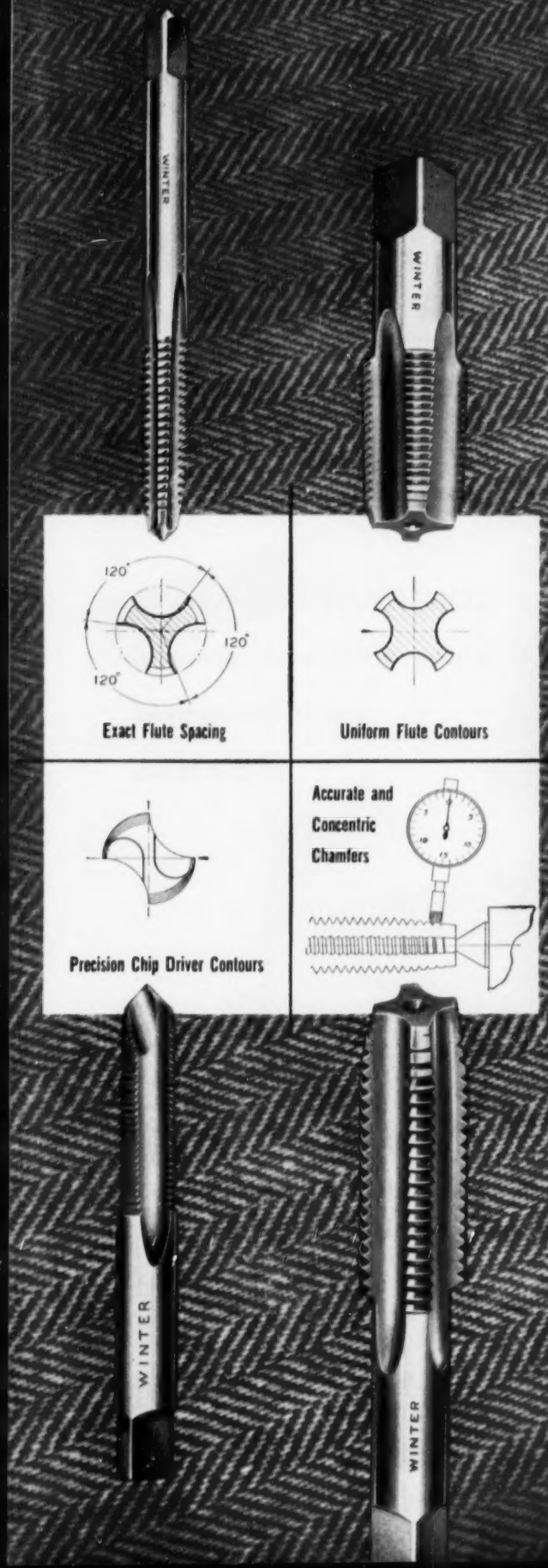
Your local Industrial Supply Distributor carries a complete stock of WINTER Taps.

Exact Flute Spacing

Uniform Flute Contours

Precision Chip Driver Contours

Accurate and Concentric Chamfers



NATIONAL TWIST DRILL & TOOL
ROCHESTER, MICH., U.S.A.

National

Today . . . Expect To Cut Metals at Lower Cost

YOU CAN—WHEN YOU HAVE CUTTING-EDGES LIKE THESE

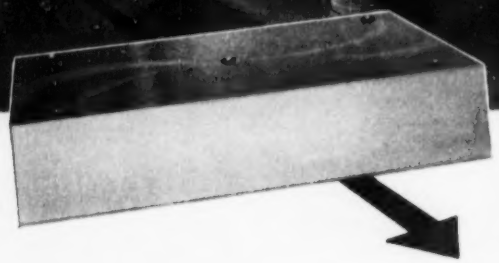
It's the cutting-edge that counts. Cutting tools today, as National designs and manufactures them, will produce more pieces at lower cost. National gives you the edge!

NATIONAL TWIST DRILL AND TOOL COMPANY
Rochester, Mich., U.S.A.

Distributors in principal cities. Factory Branches: New York, Detroit, Chicago, Dallas, San Francisco

CALL YOUR INDUSTRIAL SUPPLY DISTRIBUTOR

. . . for all your staple industrial needs, including NATIONAL Twist Drills, Reamers, Counterbores, Milling Cutters, End Mills, Hobs, and Special Tools.



Takes on all comers!

This 42-72-84 Blanchard Surface Grinder is used for machining many sizes of torch cut steel plates. As the first operation after cutting, Blanchard grinding removes the proper depth of stock as required, frequently up to ⅛" per side, producing surfaces accurately flat and parallel for laying out or further machining. Work up to 7 feet across corners is regularly ground on this machine. In spite of its size, this grinder is as easily controlled as the smaller Blanchard grinders.

Typical of work produced is the 48" x 48" x 10" machine steel, die mounting plate, at left. 58 cu. in. of stock (.025" per side) is ground off in one hour and 35 minutes, floor to floor, with flatness held to .001". Note the magnetic hoist —a good tip for loading and unloading the Blanchard quickly.

Regardless of your requirements for stock removal, tolerances or surface finish, Blanchard has the grinder and grinding wheel to do each job best.

Send for your free copies of "Work Done on the Blanchard," fourth edition, and "Art of Blanchard Surface Grinding."

PUT IT ON THE BLANCHARD

THE BLANCHARD MACHINE COMPANY **64 STATE ST., CAMBRIDGE 39, MASS., U.S.A.**

CLEEREMAN DRILLING MACHINES

LOWEST Operating Costs!

Why?

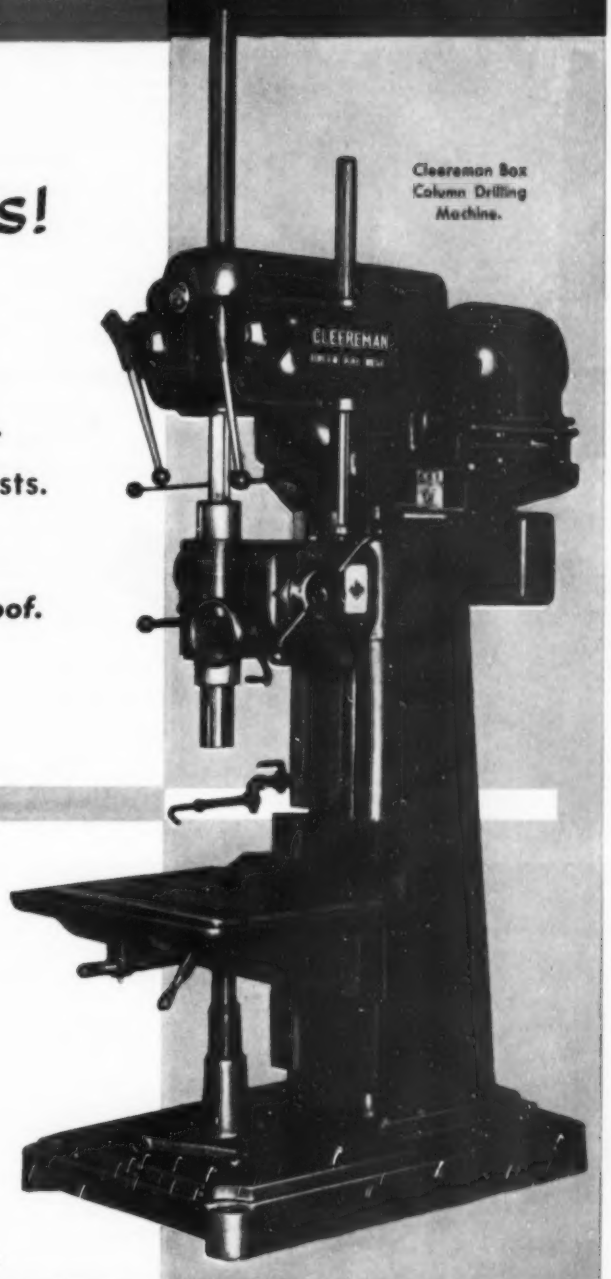
1—Eliminate Down Time.

2—More Power to Produce.

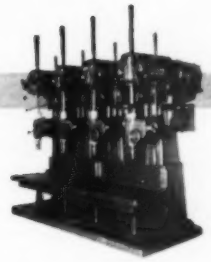
3—Lowest Maintenance Costs.

4—Less Operator Fatigue.

Go to any Cleereman user for proof.



Cleereman Box Column Drilling Machine.



Cleereman Multiple Drilling Machine.

Cleereman Round Column Drilling Machine.

BRYANT Machinery & Engineering Company

General Office
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Representatives in Principal Cities

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CLEEREMAN MACHINE TOOL CO. Green Bay, Wisconsin

BUILDERS OF PRECISION JIG BORERS AND DRILLING MACHINES

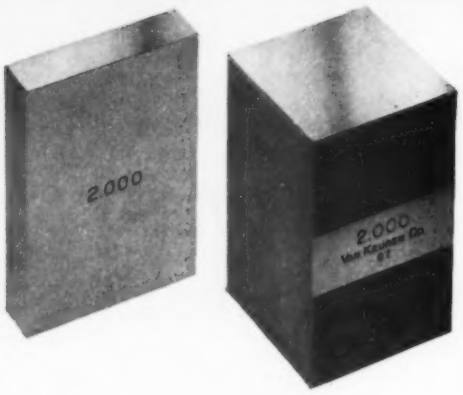
"VK" . . . the Sign of Pioneering and

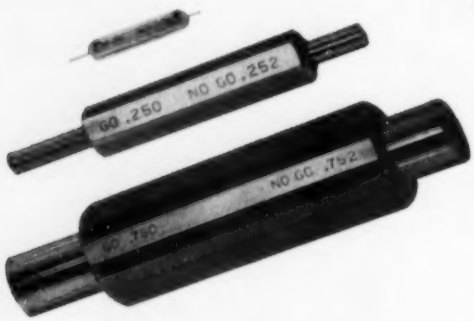
GEAR MEASURING WIRES

The Van Keuren Gear Measuring System is generally accepted as the easiest and most accurate method of checking tooth thickness of gears, involute splines and involute serrations. Catalog and Handbook No. 35 contains complete information and tables for gear measurements with wires.

GAGE BLOCKS

The Conventional Rectangular Gage Block shown, .360 x 1.375", area .50 sq. inches, is designed for ordinary use; the Solid Square Master Block, 1¼" x 1¼", area 1.56 sq. inches, is designed for many years service, and unconditionally guaranteed against wear in excess of .0001" for 5 years. See Van Keuren Handbook for details.





WIRE TYPE PLUG GAGES

Made in all sizes from .010" to 1.000" diameter. Originated by Van Keuren. Recommended materials:
High Speed Steel, in sizes from .010" to .050"; Chromium Alloy Tool Steel, in sizes from .051" to 1.000"; Hard Chromium Plate, in sizes .016" to 1.000"; VK Carboloy, sizes from .016" to .500".

OPTICAL FLATS

Ideal for all kinds of flatness tests, checking parallelism with elimination of temperature errors. New Van Keuren Light Wave Measuring Equipment includes double-surface fused quartz optical flats and improved monochromatic light of proved superlative value and economy. See Van Keuren Handbook for complete information.

34 years
1919
1953

In the Van Keuren family of Precision Measuring Tools are included the world's most accurate—tools for checking to hundred-thousandths and millionths of an inch. Whether gage blocks, optical flats, plug gages or measuring wires are required, all will incorporate Van Keuren quality. And no commercially practical measuring tools are available today for closer tolerance determination than those which are being regularly and currently produced by Van Keuren for everyday use in the metalworking industry.

Should future precision standards demand even closer checking than is now practical, metalworking can look with confidence to Van Keuren pioneering and leadership to develop and provide such measuring tools as may be required.

THE Van Keuren CO.

173 WALTHAM STREET

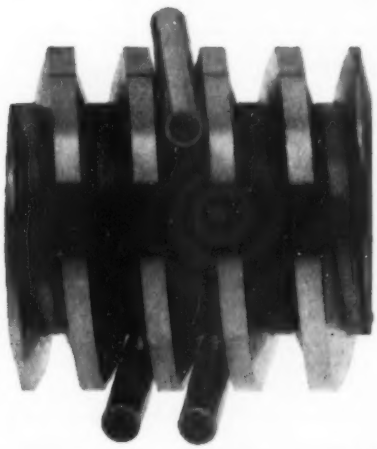
Leadership in Precision Measurements

CALIBRATED STEEL BALLS

Recommended for the precise measurement of internal annular grooves and for comparative measurements of throated worm wheels. Set shown (No. B 23) consists of 23 sets of 3 each 1/16 to ½" by 32nds and 9/16 to 1" by 16ths. Are within .0003" of nominal size but are calibrated accurate within 25 millionths of an inch. VK Handbook gives complete details.

MICROGAGES

Van Keuren Microgages have been popular for over twenty-five years because they provide a low cost means of securing accuracy in the shop to meet the demands of the inspection department. These ⅞" diameter gages are made to a tolerance +.000012" —.000008". For standard sets, see Catalog No. 35.

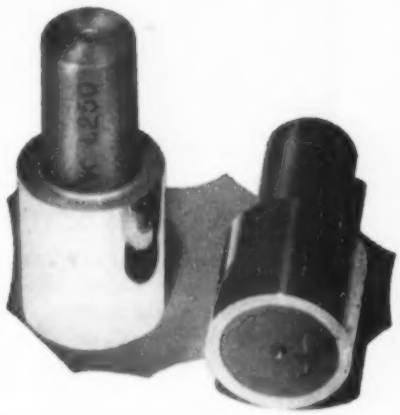


THREAD MEASURING WIRES

Available for every purpose—for worms, splines, gears, standard and special screw threads. Illustration shows .2574" diameter Flush Wires in a 29° worm having 2 threads per inch. For multiple start worms having lead angles greater than 5°, see VK screw thread tables in Handbook which gives Exact Best Size wire and exact measurement over the wires. VK Thread Measuring Wires are standard everywhere.

TAPER INSERT PLUG GAGES

Van Keuren Taper Insert Plug Gages are furnished in Class XX, X, Y, and Z accuracies. They are available in sizes up to 2.510" diameter in both alloy tool steel and in Van Keuren precision hard chromium plate. Made to AGD specifications, with slightly longer No Go members, front end of gaging units counterbored, squared and chamfered.



The metalworking industry has come to look to Van Keuren not only for precision measuring tools but also for the ways and means of applying them in the tool room and on the production line. Procedures developed by Van Keuren are in many cases standard shop practice today. We point specifically to gear measurement techniques, as applied regularly in today's gear-making shops and departments, most of which are a pioneering contribution by Van Keuren.

To make all this data and all the formulas required conveniently available, Van Keuren publishes its 224-page Catalog and Handbook containing material obtainable nowhere else under one cover—a Handbook of vitally important and usable information on Precision Measuring which is regularly revised to keep it up to date and consistent with the most advanced practices and techniques in checking and measuring.

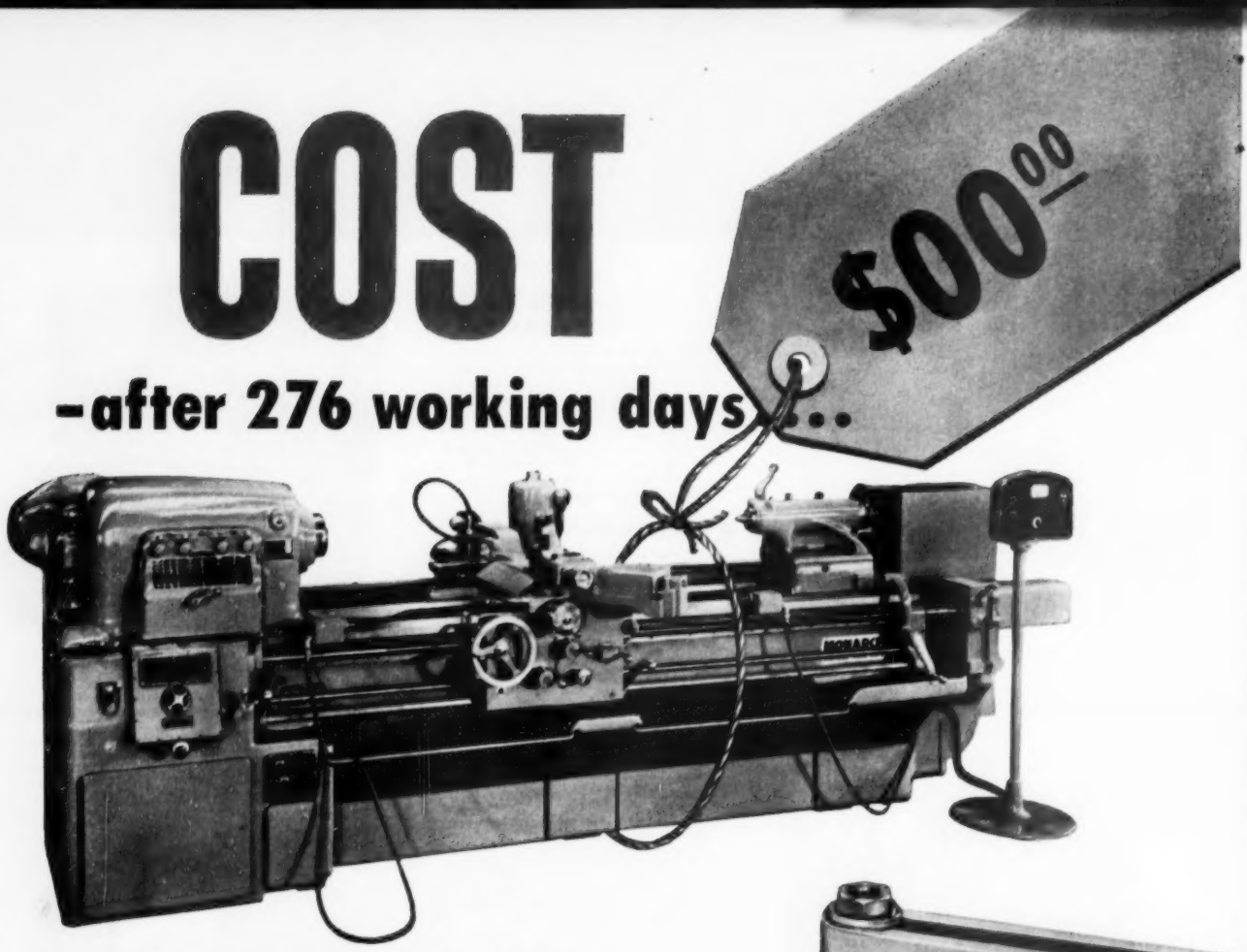
The current 1952 Van Keuren Catalog and Handbook, No. 35, is available on request and includes complete details on the Van Keuren family of Precision Measuring Tools.

Light Wave Equipment . . . Light Wave Micrometers . . . Gage Blocks . . . Taper Insert Plug Gages. . . . Wire Type Plug Gages . . . Measuring Wires . . . Thread Measuring Wires . . . Gear Measuring System . . . Shop Triangles . . . Carboloy Cemented Carbide Plug Gages . . . Carboloy Cemented Carbide Measuring Wires.

WATERTOWN, MASS.

COST

-after 276 working days...



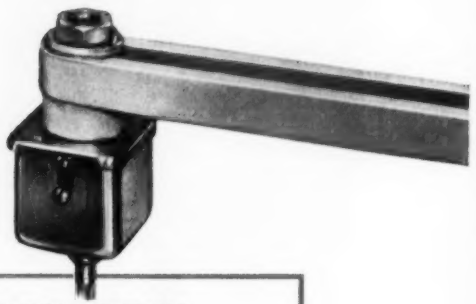
IT WROTE OFF ITS COST IN 10½ MONTHS!

This report comes from a well-known machine tool manufacturer (not us!). We can show you many similar ones from all kinds of plants. They all add up to one incontrovertible fact—Monarch Air-Gage Tracer controlled, fully automatic turning, with its single running tool, delivers output at top efficiency. Why not? Look how many ways it saves! In turning time. In setup time. In tooling time and costs. In subsequent grinding. It's true of short runs as well as long ones.

The Monarch Air-Gage Tracer is known everywhere for its superb accuracy of duplication. The swiveling type used here adds to this accuracy an amazing versatility. Apply it to our 20 x 72 Series 60 Lathe and add the Autocycle Control as above, and you have the shop man's dream come true—the ultimate in versatility *plus* fully automatic operation.

This manufacturer, after only brief experience with his Series 60, quickly added a 20 x 168 Model M Heavy Duty Lathe with similar equipment. Together, using round templates, these machines are delivering automatic output of over 600 jobs!

The Air-Gage Tracer is right! Its performance is right! Why don't *you* write—for complete information? Request Booklet #2606 and mention your specific requirements. . . . *The Monarch Machine Tool Company, Sidney, Ohio.*



HERE'S HOW!

. . . And by the user's own figures! This lathe was bought to turn 20 to 25 jobs. It proved so versatile that, with the larger Model M, it's now turning 600. Time savings vary from job to job, but here's a sample. One difficult work piece used to require 3⅓ hours' turning. It's turned now—in lots of 24—in 10 min. per piece. Each *lot* in only slightly more time than it used to take for each *piece!*

Monarch

ACCURACY • ECONOMY • LONG LIFE

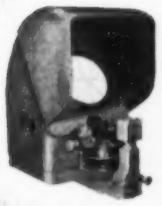
TURNING MACHINES

• • • • FOR A GOOD TURN FASTER • • • • • TURN TO MONARCH • • • • • •

11 MODELS

3 SCREEN SIZES

Pedestal Type
14" Diam. Screen



Bench Type
14" Diam. Screen
4 Models

Bench Type
5¾" x 7¾" Screen
3 Models

Unsurpassed Inspection Versatility

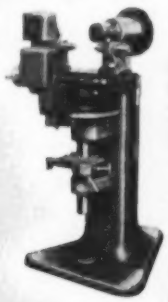
JONES & LAMSON OPTICAL COMPARATORS

The Essence of Quality Control

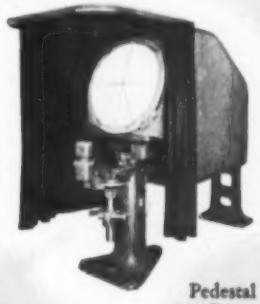
Jones & Lamson Optical Comparators are designed and built like rugged machine tools to withstand vibration and hard use. Yet they have the built-in accuracy to satisfy the most exacting laboratory standards.

- **They meet** the requirements of toolroom, laboratory and production inspection.
- **They precisely measure** height, depth, lead or spacing, as well as angles to degrees and minutes. They will measure to .0001".
- **They compare** intricately contoured parts with a master outline – and measure the amount of error.
- **They are convenient** to operate, easy to set up and read direct – *without computation.*
- **They operate** under normal lighting conditions. *No darkroom is needed.*
- **They will photograph** the enlarged shadow and record its relationship to a master chart.
- **Several persons** may study the shadow *at the same time.*
- **They will inspect** and measure surface contours, as well as profiles of objects such as type faces, stamping dies, punches, worn tools, etc.

Vertical Type
14" Diam. Screen



Direct
Projection
Type



Pedestal Type
30" Diam. Screen

P.S. A complete line of STANDARD CHARTS and FIXTURES is maintained by us.

JONES & LAMSON

JONES & LAMSON MACHINE COMPANY
502 Clinton St., Springfield, Vt., U.S.A.

Machine Tool Craftsmen Since 1835

COMPARATOR DIV.
Dept. 710

Jones & Lamson Machine Company
502 Clinton Street, Dept. 710
Springfield, Vermont, U. S. A.
Please send Comparator Catalog No. 402.

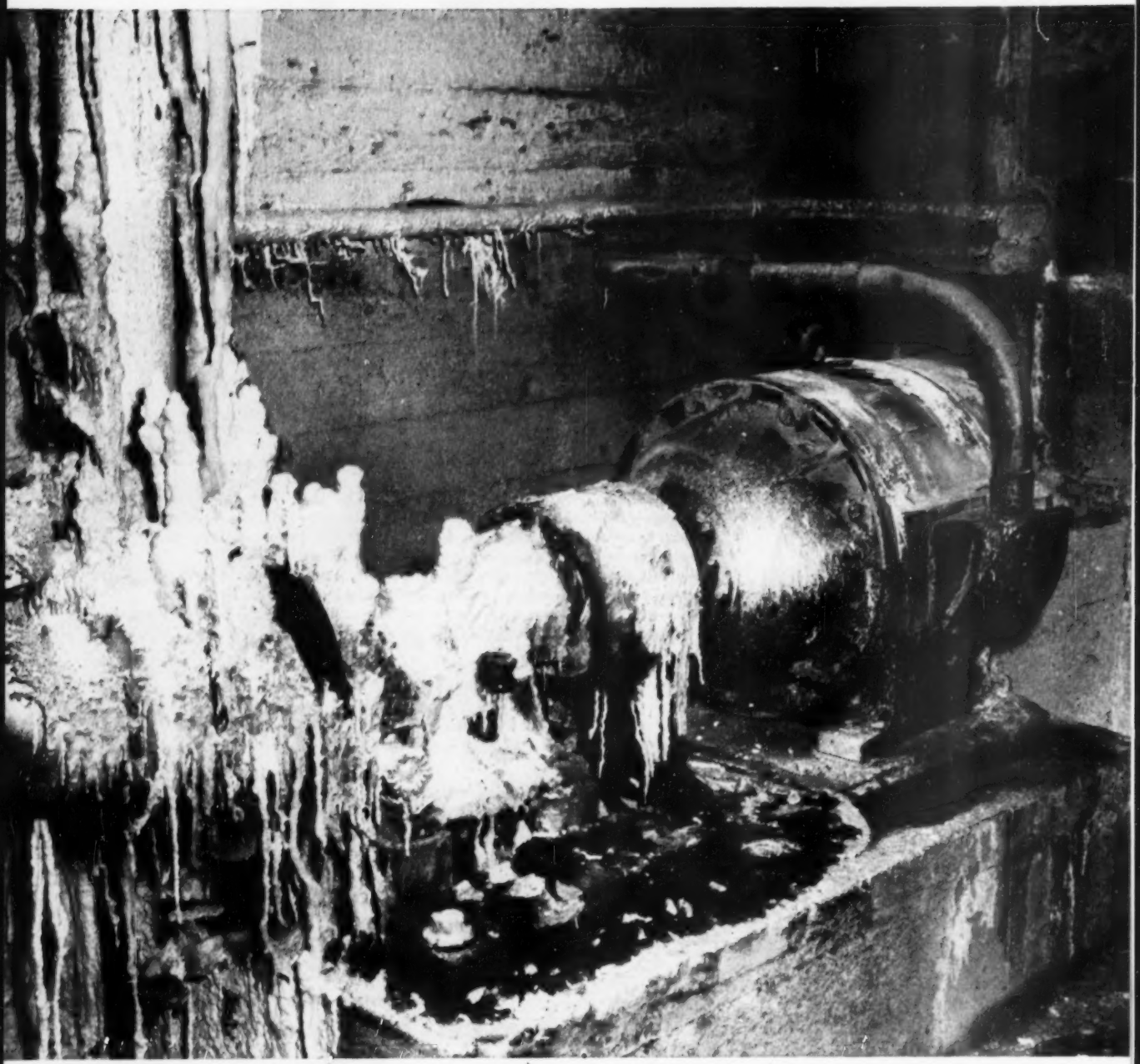
NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ STATE_____

WHEN JOBS ARE TOUGH



CORROSIVE ATMOSPHERE doesn't bother this standard, "off-the-shelf" Tri-Clad motor. Totally enclosed, fan cooled, it runs 12 hours a day, six days a week, driving a flash cooler pump under tough conditions in a chemical plant.

GENERAL ELECTRIC

INDUSTRY DEPENDS ON G-E TRI-CLAD MOTORS

REG. U.S. PAT. OFF.

Here are three typical tough jobs being done safely, economically, and without interruption, by G-E Tri-Clad motors. They help show why more than 10,000,000 horsepower of G-E Tri-Clad motors are serving American industry today.

WIDEST VARIETY

With the widest selection of standard motors obtainable anywhere, the Tri-Clad motor line offers ratings up to 2000 hp; all types of enclosures; gear motors, brake motors, and adjustable-speed drives—plus many other mechanical and electrical modifications to meet your requirements.

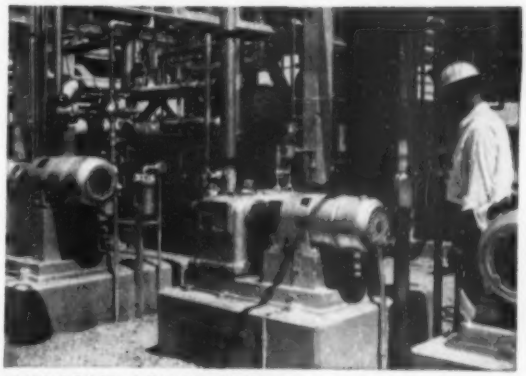
TRIPLE PROTECTION

You get triple protection with *every* Tri-Clad motor—against physical damage, electrical breakdown, and operating wear and tear. Completely enclosed bearings last longer because they can be relubricated if necessary—and *without shutdown!* For specific product information, use the coupon below, or contact your nearby G-E Apparatus Sales Office, authorized G-E Agent or Distributor.

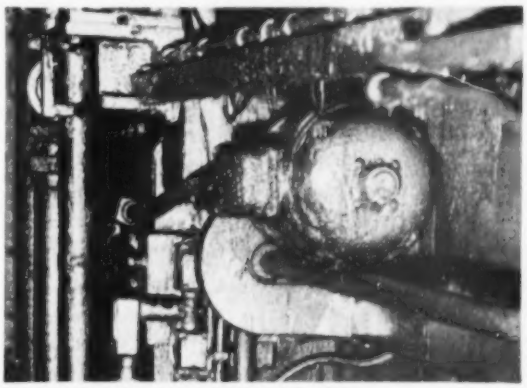
IMMEDIATE DELIVERY

Most standard G-E Tri-Clad motors are available immediately from stock. And the most complete sales and service network in the motor industry assures you prompt service by trained specialist and application engineers, for all your motor problems. General Electric Co., Schenectady 5, New York.

752-16



EXPLOSIVE ATMOSPHERE dangers are avoided by using standard explosion-proof Tri-Clad motors, such as these gear-motors driving water and hydrocarbon pumps in an oil refinery.



OIL, MOISTURE, ABRASIVE DUST can't stop this totally-enclosed Tri-Clad motor, operating below the strip in a cold strip steel mill. Motor is completely protected inside and out.

PROGRESSIVE MECHANIZATION . . .

a new G-E MORE POWER TO AMERICA program—motion picture and manual—case histories of the latest mechanization trends.

Send for literature.

Section M752-16
General Electric Co., Schenectady 5, N. Y.

Please send me the following on Progressive Mechanization:

☐ **Free copy of the Progressive Mechanization Manual (GEA-5789)**

Please send the following product bulletins:

☐ **GEA-3580 (Open Dripproof Motors)**

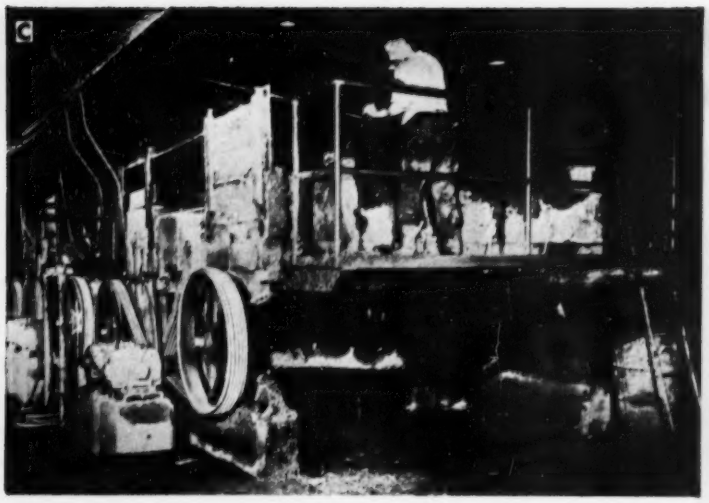
☐ **GEA-4400 (Totally Enclosed Motors)**

Name .....

Firm .....

Address .....

City ..... **Zone** ..... **State** .....



These packer screens at the Liberty Paper Board Company, Steubenville, Ohio, were formerly driven from a lineshaft by flat belts. Gates Vulco Ropes, driving from individual motors to the same flat pulleys, have eliminated shutdowns and interruptions of operation—with total savings of $5,000 per year.

Why a V-Belt with Concave Sides Wears Longer...

—Just try this yourself!

Pick up *any* V-Belt and bend it as if it were going around a pulley. As it bends, grip its side between your fingers and thumb. Here is what you will feel—*every time.*

If the V-Belt has *straight sides,* you feel those sides *bulge out.* This forces the sides of the belt to press *unevenly* against the V-Pulley and you naturally get *concentrated* wear along the bulge —as shown in figure 1-A, below at right.

Now, try this same test with the belt that is built with CONCAVE SIDES—the Gates Vulco Rope!

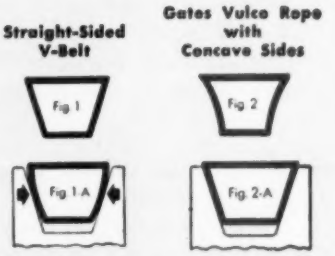
You find that the CONCAVE SIDES fill out and become perfectly straight. The sides press *evenly* against the V-Pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means *longer* belt *life* and *lower* belt *costs* for you.

The CONCAVE SIDES of Gates Vulco Ropes (U. S. Patent No. 1813698) clearly give you (1) Less wear, (2) More pulley contact, (3) More sure power transmitted when needed!

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE SIDES—the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

What Happens When a V-Belt Bends



How Straight-Sided V-Belt Bulges in the Sheave-Groove. Sides Press Unevenly Against the V-Pulley, Causing Extra Wear at Point Shown by Arrows.

The Concave Sides Fill Out to a Precise Fit in Sheave-Groove. No Side-bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-5211

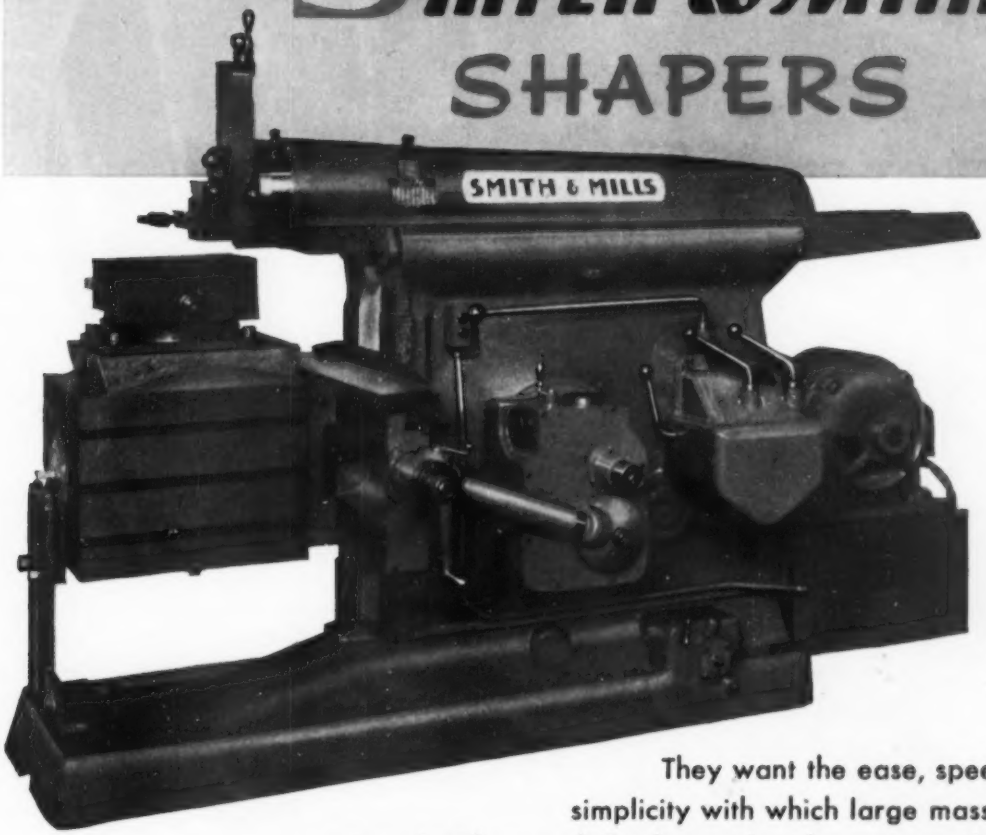
V-Belts — Hose
Molded Rubber Goods
for industry
World's Largest Maker of V-Belts

Gates® VULCO® ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

After 64 Years - Operators Still Want

Smith & Mills SHAPERS



They want the ease, speed and simplicity with which large masses are removed with smooth finish — and such operating features as solid ram — ram position adjustment — simple speed selection — quickly handled feed mechanism — fast, easy stroke setting — power rapid traverse — and the combination of brute strength and sensitivity.

Management, too, wants Smith & Mills' low maintenance costs and minimum down time for heavy metal cutting production jobs and their extreme precision tool room work.

The Smith & Mills COMPANY

affiliated with **Bryant Machinery & Engineering Company**

General Office: 400 West Madison Street, Chicago 6

EXCLUSIVE REPRESENTATIVES THROUGHOUT THE WORLD

Fine Shapers since 1888

WHAT *Life-Line* REALLY DELIVERS IS MORE SERVICE...LESS SERVICING

Only modern motors and controls give you these features

Motors and controls have been built much the same way for years. Motors required frequent lubrication . . . controls needed constant maintenance. But, you can get really modern equipment built to standards that match today's speeded production requirements.

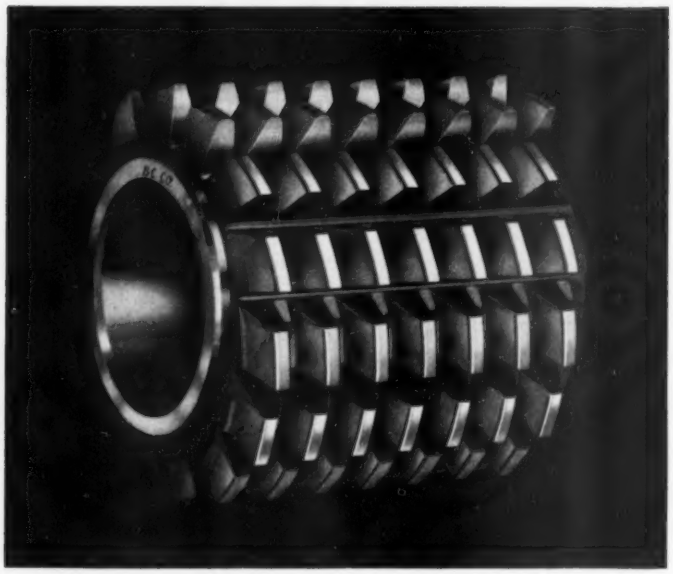
"De-ion®" arc quenching used on Life-Linestarters has proved the most efficient method of increasing contact life and interrupting capacity. Pictured on the left is the exclusive Westinghouse "De-ion" Quencher at work. In 1/120 of a second, arcs are confined, divided, extinguished—a *basic* to long contact life and equipment protection. It's the last word in arc quenching. Combined with silver contacts, this "De-ion" principle eliminates the need for constant contact maintenance. Contacts *never need* filing.

Pre-lubricated bearings on Life-Line motors have introduced new freedom from motor maintenance. You eliminate bearing failures due to overlubrication, under lubrication, and from entrance of dirt into bearings. Result is reduction of motor down time. Certainly, the way to grease a modern motor is *don't*. Results of over half a million Life-Line motors serving every phase of industry show motor failures cut in half!

It's this kind of advanced features that puts Life-Line motors and Life-Linestarters years ahead of conventional equipment. Get all the reasons why. Ask your Westinghouse representative for full details, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21693-A

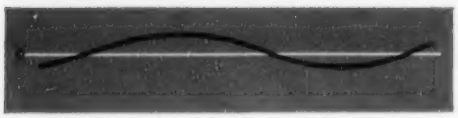
YOU CAN BE SURE...IF IT'S Westinghouse

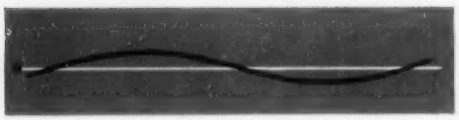
CLASS AA HOBS
FOR THE FINEST IN GEAR ACCURACY



CONTROL LIMITS WITHIN CLOSE RANGE

Although the hob is not the only factor affecting the accuracy of gears, it does have an important effect, particularly upon the profile of the gear. Barber-Colman makes hobs to all the standard tolerances to satisfy any of your gear requirements.





In addition to the standard classes, Barber-Colman has developed the Class AA hob which is made to consistently closer tolerances than any other hobs. This class of hob has proved itself in actual production for many years and is recommended for the utmost in accuracy if other conditions warrant the use of such a fine tool.

Within established standard hob tolerances, some hobs naturally approach high or low limits to a greater degree than others. On certain classes of work, it may be necessary to select from your tool crib the hobs which cut the most accurate gears. In such cases when you require hobs of the finest and most consistent accuracy, we suggest your consideration of Class AA hobs.

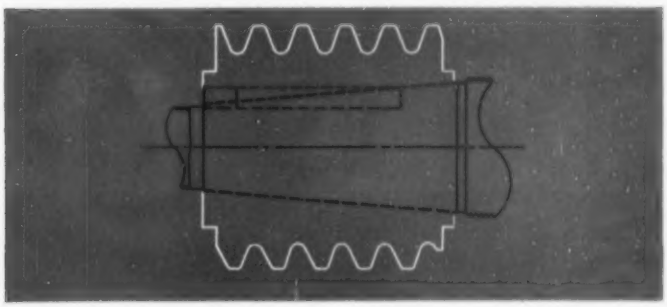
In many cases, your gear requirements may not demand this degree of precision control. But whatever your hobbing problems may be, Barber-Colman Engineers will be glad to help you solve them.

D E S I G N E R S O F S T A N D A R D A N D S P E C I A L

TAPER HOLE HOBS AID ACCURACY CONTROL

Runout can destroy most of the inherent accuracy of a hob. As a further step in accuracy control, Barber-Colman Hob Engineers have developed hobs with taper bores. They are recommended for all Class AA Hobs, and for all hobbing jobs where accuracy is paramount.

Where high accuracy requirements are demanded it is much easier to true hobs with the taper bore mounting. Compared with the sliding contact on straight hole hobs, the taper provides metal-to-metal contact, eliminating the possibility of an increase in runout during the cutting operation. Also, much time is saved by the operator because the hob will run as true as the spindle.



TAPER BORES PROVIDE TRUE CENTERING ACTION

Production-line accuracy in all metal cutting operations is constantly approaching closer limits. Gear hobbing is perhaps the outstanding example. When you have gear tooth problems be sure to ask Barber-Colman Hobbing Engineers to work with you. One of the longest experiences in gear cutting is available to you without cost or obligation.

Write for a copy of Hobbing Notes — *"Hobbing Accurate Gears"*

HOBS • CUTTERS • REAMERS
HOBBING MACHINES
HOB SHARPENING MACHINES

BARBER COLMAN

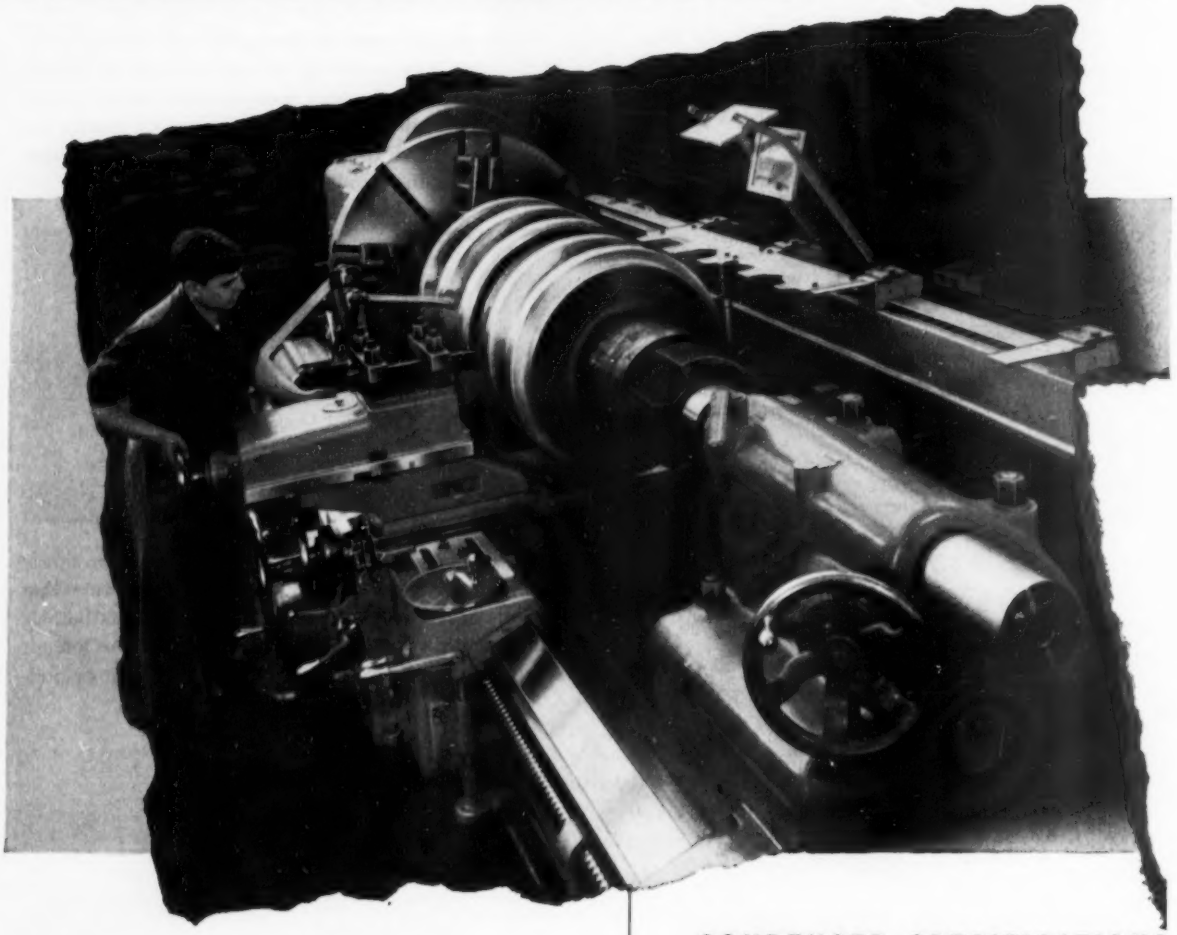
Barber-Colman Company

GENERAL OFFICES AND PLANT, 711 ROCK STREET, ROCKFORD, ILLINOIS, U.S.A.

METAL CUTTING TOOLS SINCE 1908

Coming Soon...

A DEMONSTRATION: LEBLOND



Two-directional hydraulic tracing uses simple template.

Tracing stylus controls cross and length feed, powered by hydraulic motors.

All controls at apron; speed and feed can be varied during cut without interrupting the finish.

Fast roughing by means of length feed only—template serves as length stop.

Mechanical power rapid traverse to carriage and cross slide in both directions built into apron. Also, hydraulic rapid traverse for retracting cross slide when under tracer control.

Standard feeds and threads available through quick change box—hydraulic motors disconnected through fool-proof interlock.

USERS REPORT SAVINGS OF MORE THAN 75%.

CONDENSED SPECIFICATIONS

Lathe size	32"	40"	50"
Swing over cross slide	22"	28"	35"
Constant hp DC motor, 2 to 1 speed change	30 hp	40 or 50 hp	
Mechanical speed changes in head	8	9	9
Speed range, variable, rpm	2.5-230	1-165	1-165
Hydraulic Feed	VARIABLE		

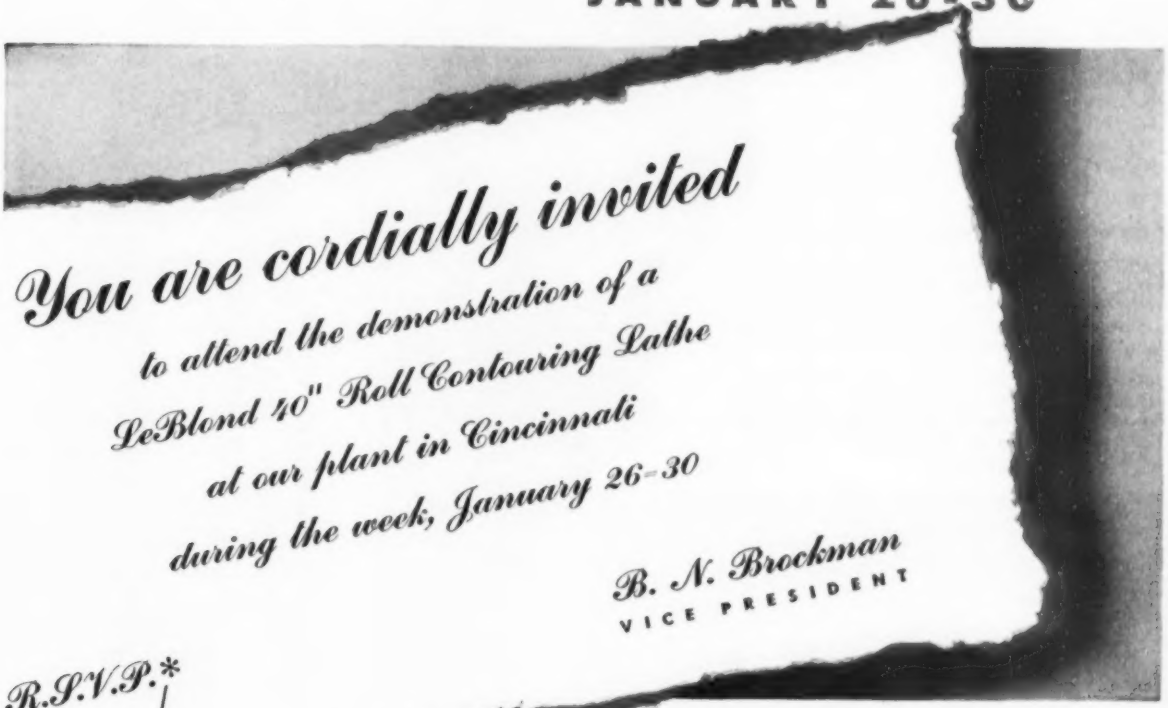
Single speed AC drive also available.

WRITE FOR COMPLETE INFORMATION

ROLL-CONTOURING LATHE

See it in operation at the LeBlond Plant

JANUARY 26-30



THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

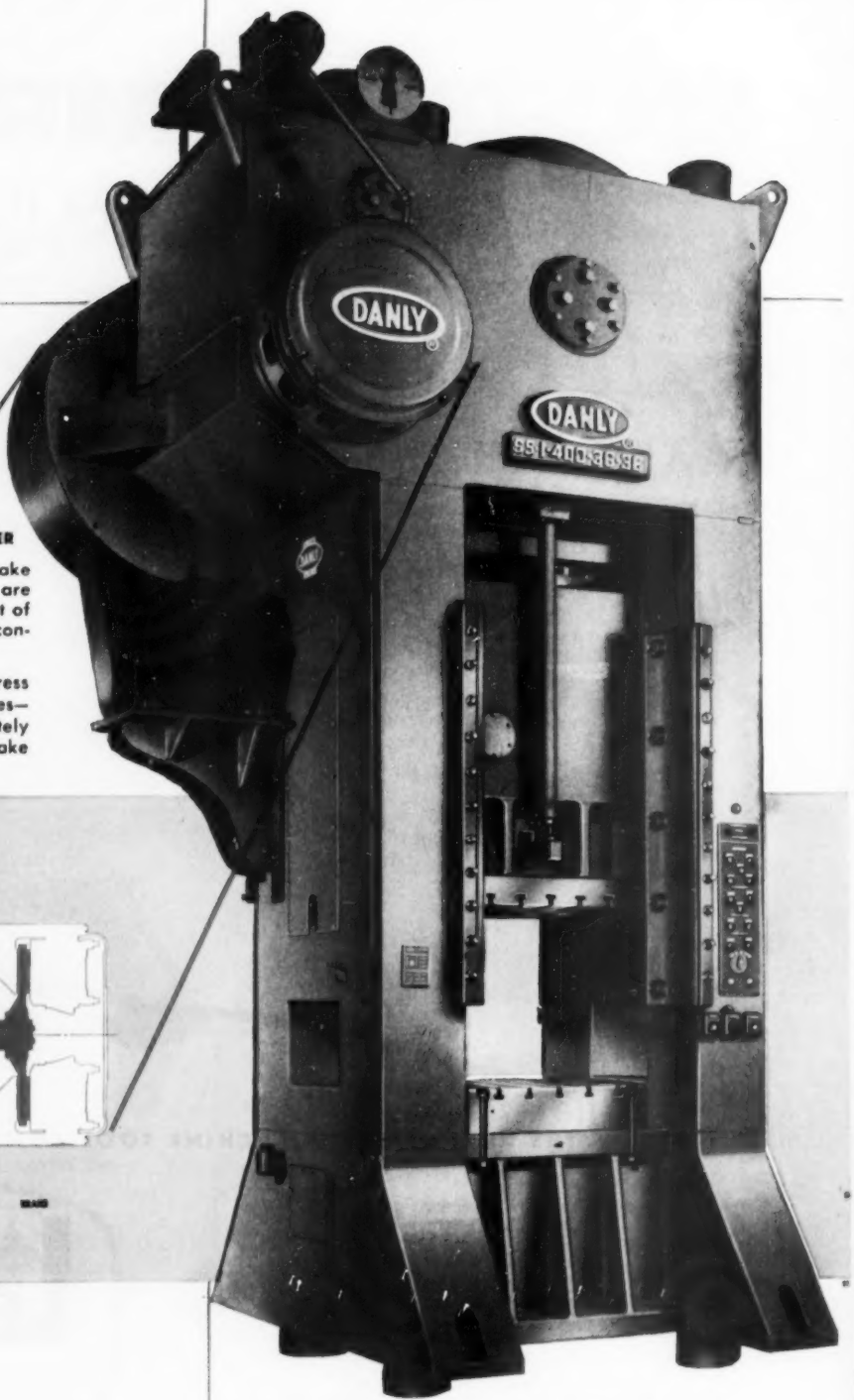
* Please tell us which day you'd like to come. We'll confirm.

turned faster by

LEBLOND of Cincinnati

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 65 YEARS*

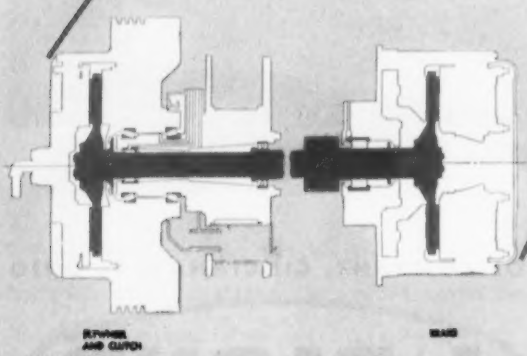
when you buy presses...



WHY THE DANLY CLUTCH AND BRAKE RUN COOLER

The rotating parts in a Danly clutch and Brake subject to "pick-up" during clutch engagement are shown in color. Danly design reduces the weight of these parts to only 1/5 as much as those in a conventional clutch of comparable torque rating.

The total energy to pick up all parts of the press subject to acceleration—including slide and dies—during clutch engagement is reduced approximately two-thirds. That's why the Danly Clutch and Brake run cooler and last longer.



A Danly 400 ton Single Action One Point Straight Side Press equipped with the Danly Cool-Running Clutch. Outboard mounting of both clutch and brake permit renewal of friction discs in less than 30 minutes.

take a close look at the drive

Actual production tests show that the new Danly Cool-Running Clutch, an exclusive Danly Press feature, withstands up to 7 times more engagements than a conventional press clutch before it is necessary to make adjustment for lining wear. The resulting reduction in maintenance and press down time for clutch take-up, an important factor in press operating costs, accounts for outstanding savings.

Features like this—together with automatic lubrication and extra rigid precision construction—are the reason why time and cost conscious production men specify . . .

DANLY PRESSES

Danly's complete engineering staff is at your service to help you select the best presses for your job. Write today—and ask for the Danly Straight Side Press Catalog.

DANLY MACHINE SPECIALTIES, INC.
2100 South Laramie Avenue, Chicago 50, Illinois

It costs less to run a DANLY PRESS!

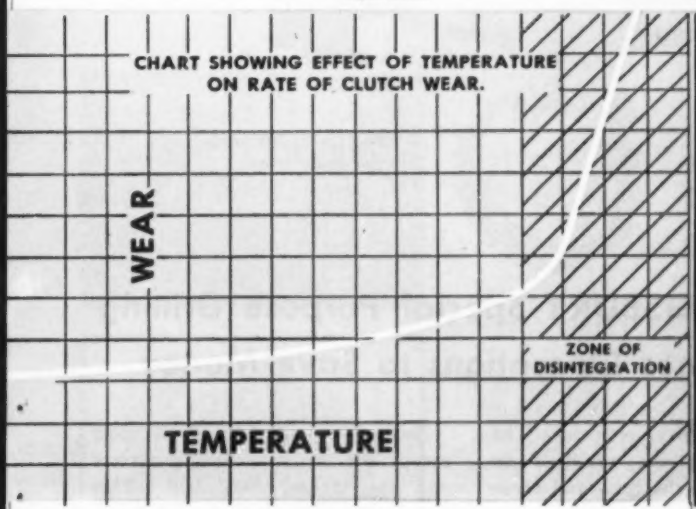
Single Action Straight Side

Autofeed

Underdrive Single, Double, Triple Action

Gap Frame

Double Action Straight Side



DANLY

MECHANICAL PRESSES . . . 50 TO 3000 TONS

HYDRAULIC METALWORKING EQUIPMENT

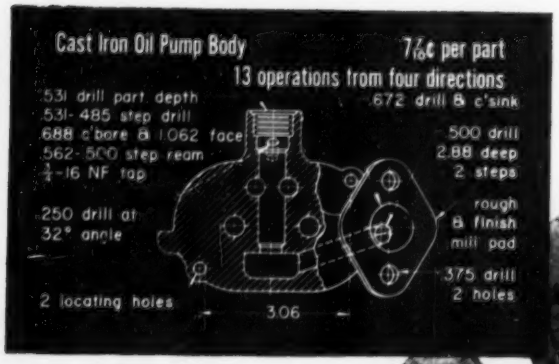
WHY DANLY FRICTION DISCS LAST UP TO 7 TIMES LONGER

Chart shows how heat causes disintegration of lining in a press clutch. The steep slope in the curve shows how wear rapidly increases with temperatures.

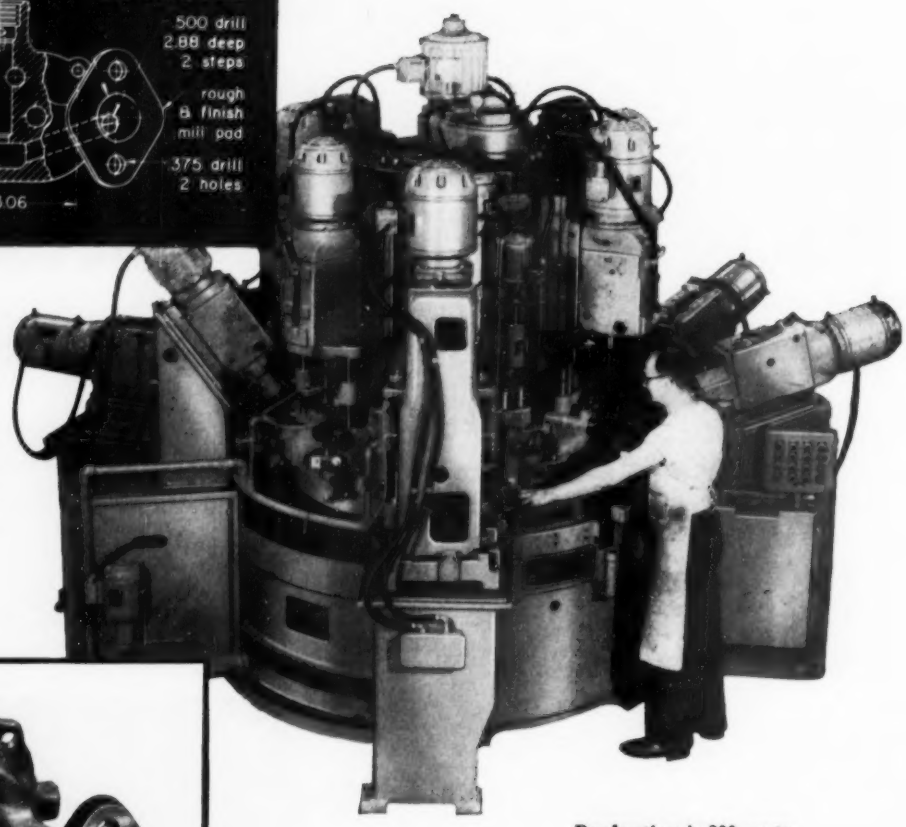
The cool running Danly clutch generates less heat and the small amount generated is rapidly carried off by a continuous blast of forced air.

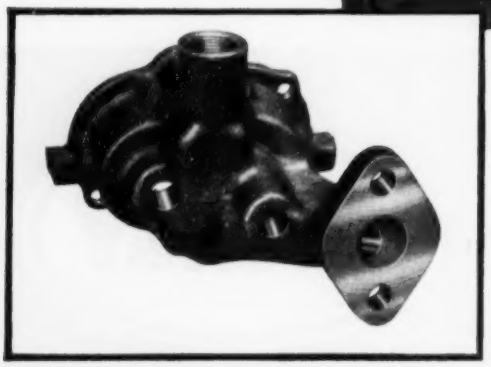
Normal operation of a Danly Cool Running Clutch is only 35° above room temperature!

More parts per man-hour soon


Cast Iron Oil Pump Body
7 7/10¢ per part
13 operations from four directions
.531 drill part depth
.531-.485 step drill
.688 c'bore & 1.062 face
.562-.500 step ream
1/2-16 NF tap
.250 drill at 32° angle
.672 drill & c'sink
.500 drill 2.88 deep 2 steps
rough & finish mill pad
.375 drill 2 holes
2 locating holes
3.06

13 Operations from 4 Directions 7 7/10¢ per part





Production is 200 parts per hour gross.

KINGSBURY Special Purpose Drilling and Tapping Machine Combines Operations to Save Money

Dear Sir:

Look at this Cast Iron Oil Pump Body. How many machines would *you* need to do all this work? One central column Kingsbury with an 84-inch base and 60-inch index table does all 13 operations. It has ten stations with 11 drilling units and one tapping unit. One unit has a two-spindle auxiliary head. Six units are mounted vertically. The other six units are mounted on knees bolted to the base and these are mounted at three different angles to the work.

The longest single operation governs the time required to finish one piece. By splitting a long operation into two short ones, using two units, the time cycle can be cut. Thus the .500 hole is drilled in two steps.

Bushing carriers guide all tools except the tap, the milling cutters and the second .500 drill. This means accurate alignment and precise positioning from the locating point. An interesting operation is the finish milling operation which has a special mechanism that draws the cutter away from the work on the up stroke. No tool marks to mar the finish.

pay for a KINGSBURY

Designed to Produce One Part

Kingsbury Machines are designed for low production costs on long runs of parts requiring several operations. The more operations at one setup, the greater are the savings possible. But these machines pay for themselves on simple work too. For example, the Steel Bearing Race shown at the lower left requires only a few operations. The Kingsbury machine soon paid for itself with more parts per man-hour at greater accuracy.

Each machine is equipped with ½ to 5 hp automatic units. The number of units and the type of work holders depend on the work to be done. The work table may be stationary or it may be indexed. Your Kingsbury will come to you ready to run.

How Unit Costs were Figured

Each unit cost shown is the sum of these two figures —

The unit cost of the man:

$$\frac{\text{average U. S. hourly rate}}{\text{hourly gross} \times 80\% \text{ efficiency}}$$

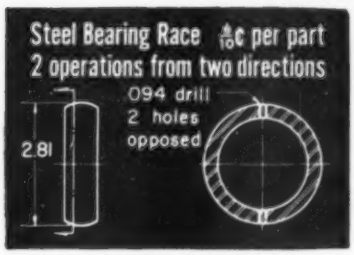
The unit cost of the machine:

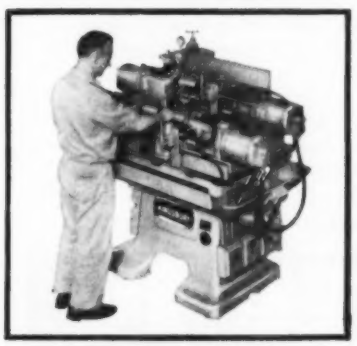
$$\frac{\text{price of tooled machine}}{\text{output in 6000 hrs. @ 80\% efficiency}}$$

The costs include just the man and the machine — no power or overhead. As to the 6000 hours, that's about three years for one shift — one year for three shifts.

If you want more information just drop us a line.

Sincerely,
Kingsbury Machine Tool Corp.
99 Laurel St., Keene, N. H.



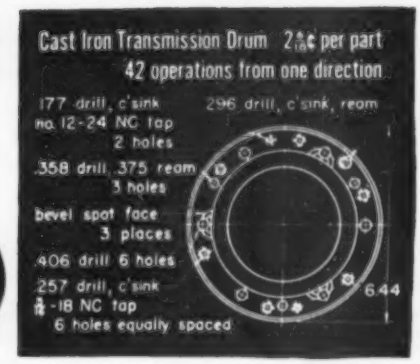


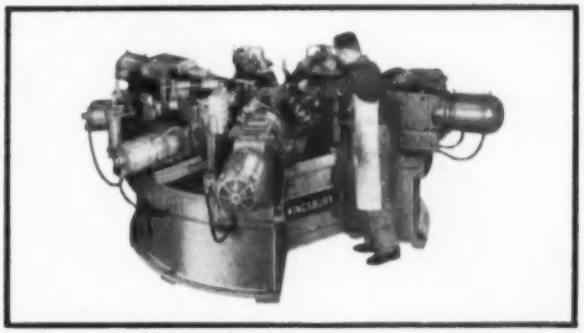
Production is 680 parts per hour gross.

The machine on the left looks simple, doesn't it? It is, but it really produces. The operator of this double end machine puts in one piece and trips a lever. Air cylinders clamp the work and opposed units drill .094. While they are operating he loads another part into the rear fixture. With two fixtures, the operator can load one while the other is working — no waiting for operations to be completed. There's no indexing, just a 46 by 24 inch rectangular table.

← Steel Bearing Race

2 Operations—from 2 Directions 4/10¢ per part





Production is 330 parts per hour gross.

↑ Cast Iron Transmission Drum

42 Operations 2 6/10¢ per part

Note the number of operations. (42 spindles are required, all working at once.) This Kingsbury machine has a 100-inch base and 30-inch index table. There are seven drilling units and one tapping unit. All are mounted horizontally and use auxiliary heads with from three to nine spindles each. Bushing carriers guide all tools but the taps. Each fixture is automatically unclamped as it indexes to the unloading station.

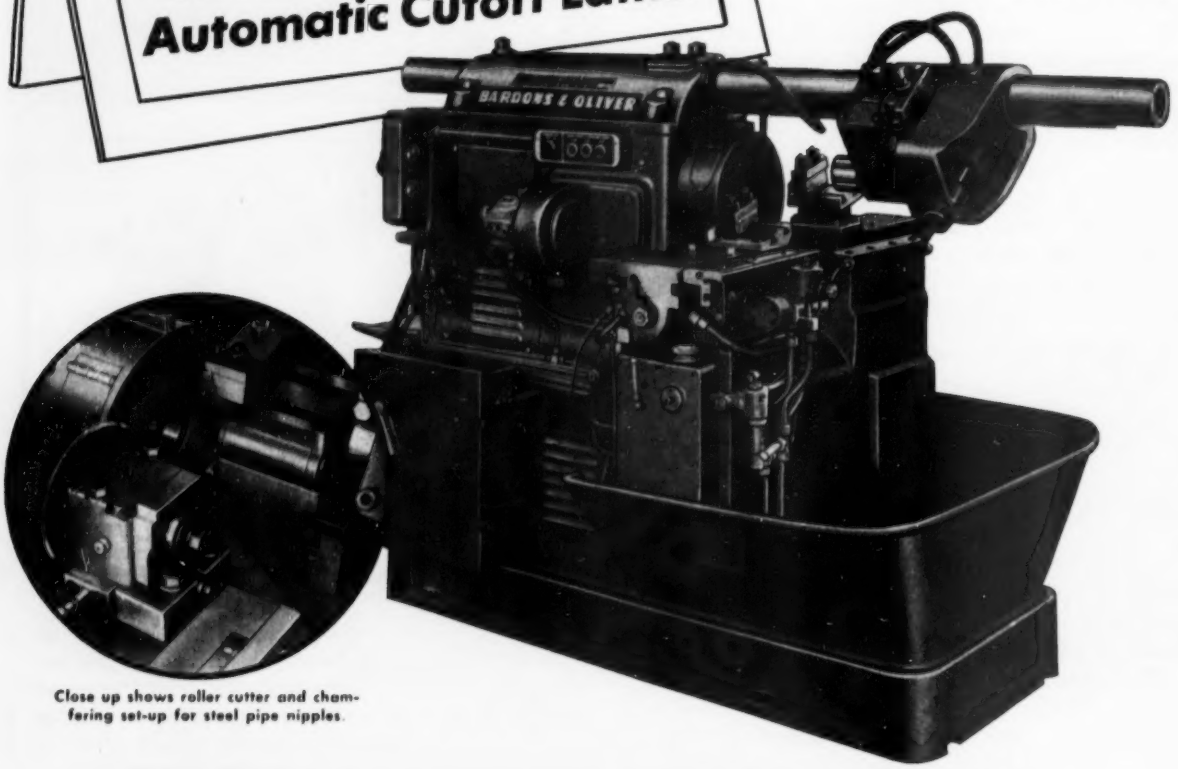
KINGSBURY

AUTOMATIC DRILLING & TAPPING MACHINES
for Low-Cost High Production

Presenting a NEW BARDONS & OLIVER Automatic Cutoff Lathe

No. 33—WITH CAPACITY TO 3" DIA. (2½" PIPE)

No. 34—WITH CAPACITY TO 4" DIA. (3½" PIPE)



Close up shows roller cutter and chamfering set-up for steel pipe nipples.

Average production on steel pipe nipple blanks up to 6" long, cutoff with roller cutter and chamfered on both ends on O. D., ready for threading.								
Pipe Size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"
Pcs. per min.	43	36	28	22	18	15	12	9

Production estimates for lengths over 6" quoted on request. Correspondingly high rates of production can be obtained when cutting off other types of tubing or pipe.

The NEW BARDONS & OLIVER No. 33 and No. 34 cutoff lathe is designed for greater productivity. Either square cut ends or roller cut ends are readily obtained with a higher rate of production. Electric remote control permits automatic cutoff to any length. Spindle speeds range from 85 to 1100 RPM with four quick changes. In addition, a pair of reversible pick-off gears makes available a total of eight speed changes. Multiple cuts can be taken with the wide, heavy cutoff slides. Independent hydraulic systems are used for the cutoff slides and collet chuck operations. Since no cams are used, a complete change in set-up from one size and length of work to another can be made in less than one-half hour.

A newly designed Stock Feed Table, which operates automatically is now available for this new Automatic Cutoff Lathe.

Complete information furnished upon request.

BARDONS & OLIVER, INC.

1134 WEST 9th STREET • CLEVELAND 13, OHIO

No. 50 Sunnen Honing Machines
SUNNEN HONES
Machines To Size and Finish INTERNAL DIAMETERS
No. 51 Sunnen Portable Cylinder Hones
SUNNEN Portable Hones
No. 505 Sunnen Honing Supplies & Accessories
STONES MANDRELS AND ACCESSORIES for the SUNNEN PRECISION HONING MACHINE
SUNNEN
No. 57 Sunnen Portable Honing
The SUNNEN HONALL
NEW MANDREL SETS for TOOL ROOMS
No. 55 Sunnen Tool Room Honing
SUNNEN External Hone...
No. 58 Sunnen External Hones

These FREE BOOKLETS on SUNNEN HONING

May Help You Solve Your Production Problems on Internal and External Diameters

If your problem is how to meet newer, more exact specifications on bores and shafts, you'll want copies of these booklets. They tell you how alert manufacturers are improving their products by honing . . . making them last longer and run smoother and cooler . . . making higher speeds permissible . . . all by using Sunnen Honing to produce smooth, accurate bushings and bores, as well as spindles, shafts, plungers and similar parts.

Use the coupon to get your free copies of these helpful booklets. No obligation.

SUNNEN PRODUCTS COMPANY
7938 Manchester Avenue • St. Louis 17, Missouri
***Canadian Factory:* Chatham, Ontario**

To: SUNNEN PRODUCTS COMPANY
7938 Manchester Ave., St. Louis 17, Mo.

☐ Please send me all 7 of the booklets.

Please send me the following booklets:

☐ No. 50 ☐ No. 51 ☐ No. 505 ☐ No. 57
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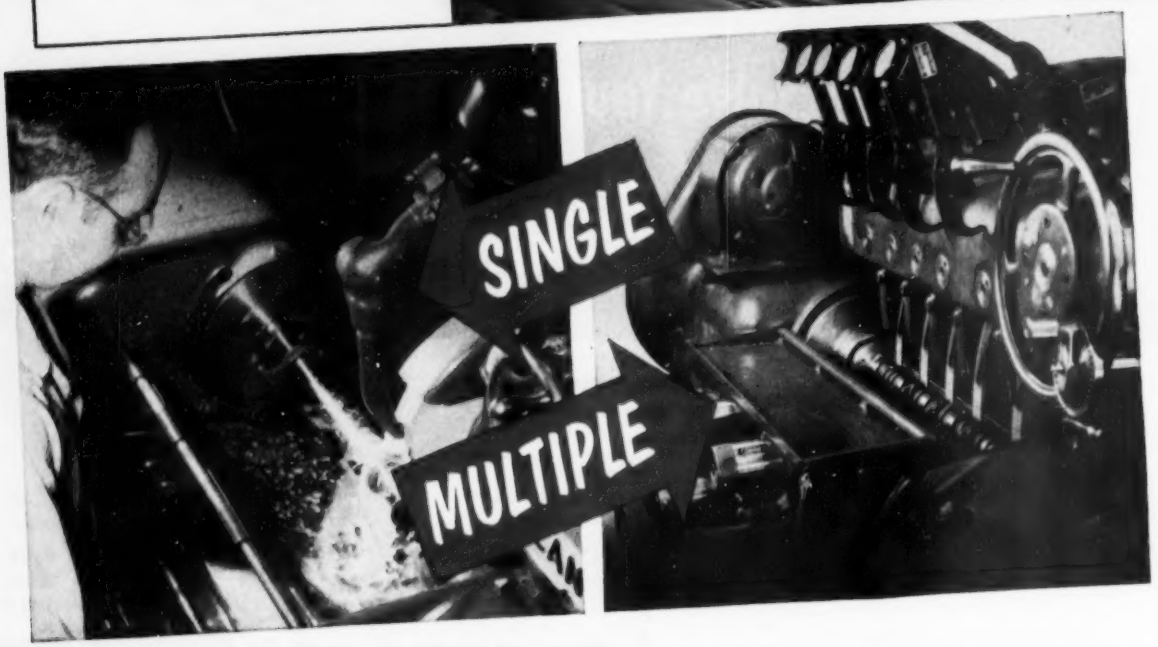
Cylindrical



Only CARBO

TRADE

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company, Niagara Falls, New York

Grinding...

Cylindrical Grinding Wheels by CARBORUNDUM give you the right combination of aluminum oxide grain and vitrified bond—the combination that, on *your* specific job, spells highest output at lowest cost.

ABRASIVE GRADES

ALOXITE "A"—a more friable type of regular aluminum oxide grain for roughing and finishing on soft to medium hard stock.

ALOXITE "AA"—chemically pure type of aluminum oxide grain, extremely friable and thus ideal for grinding heat-sensitive, hard alloy steels.

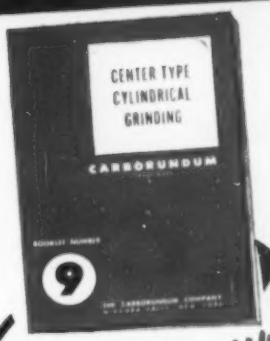
ALOXITE "DA"—blend of "A" and "AA" grain types. Cuts cool and fast on the harder heat treated steels.

VITRIFIED BONDS

"V10"—cool cutting, yet tough... the standard structure is superior on form grinding work and wherever finish is more important than stock removal.

"V11"—for moderate to heavy stock removal. Very cool cutting, with a more open structure that promotes high cutting rates. Holds corners well. Widely preferred on crankshaft work.

"V12"—a very open structure uniquely successful on large crankshafts. Generates a precision finish, free from burns, on difficult work involving large areas of contact, high sidewalls and large pin diameters.



This "tell-all" booklet is FREE!

Write Dept. AM 81-83 for your copy

And for cylindrical grinding of low tensile materials, CARBORUNDUM silicon carbide wheels, in two types of abrasive grain and two types of vitrified bond, deliver the same high-output, low-cost production on cast iron, aluminum, brass, etc.

ORDER FROM YOUR CARBORUNDUM DISTRIBUTOR TODAY. He's your best bet for complete stocks, prompt delivery, experienced counsel on latest developments in the field. You'll find him listed in the yellow pages under "Abrasives." Phone him today—it's to your profit!

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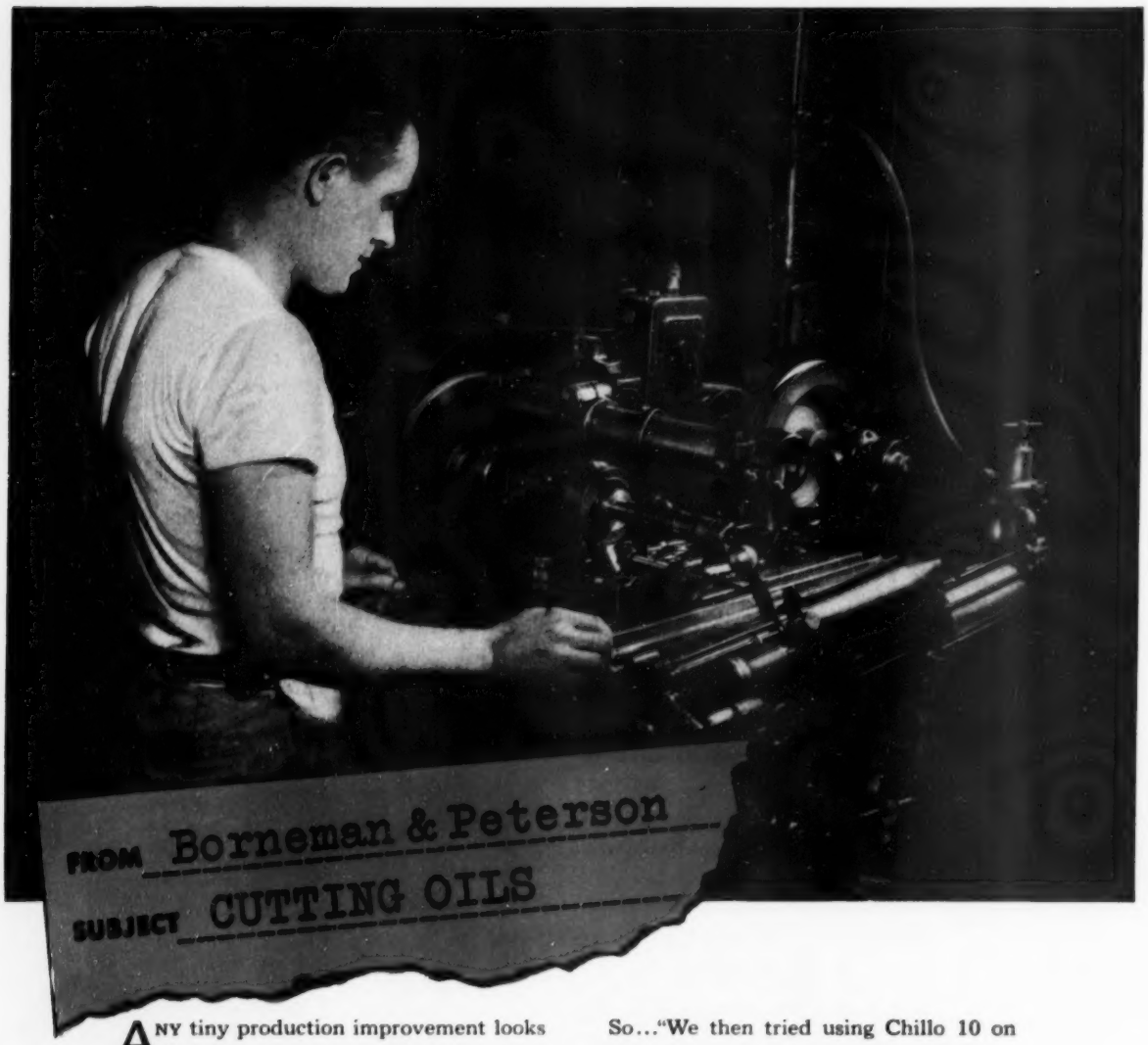
offers ALL abrasive products...to give you the proper ONE

81-83



ANY tiny production improvement looks big when it can be multiplied by acres of machines. But even without that—in an average size screw machine products shop like Borneman & Peterson's at Flint, Michigan—the improvement effected with Cities Service cutting oil registered impressively.

"We were getting fair results," write Borneman & Peterson, "before ever talking it over with a Cities Service Lubrication Engineer."

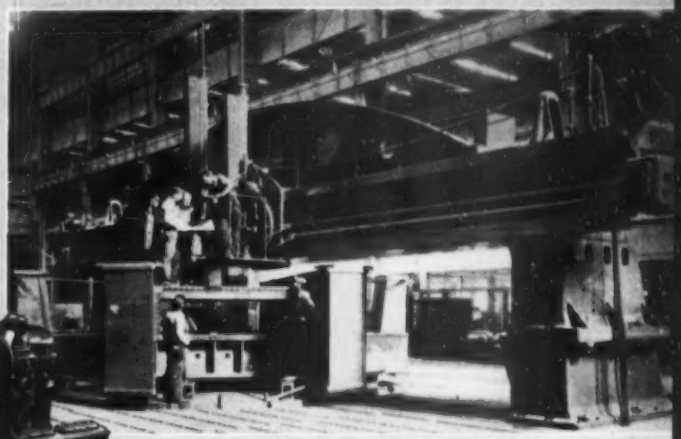
But they did talk it over, and then tried out his recommendation on a regular job of cutting ½" x 1" slots in tough tool steel. At once, the use of Cities Service Chillo cutting oil notably improved product quality.

So..."We then tried using Chillo 10 on our threading machines, and found that not only do we get a better thread, but we have increased chaser life approximately 25%."

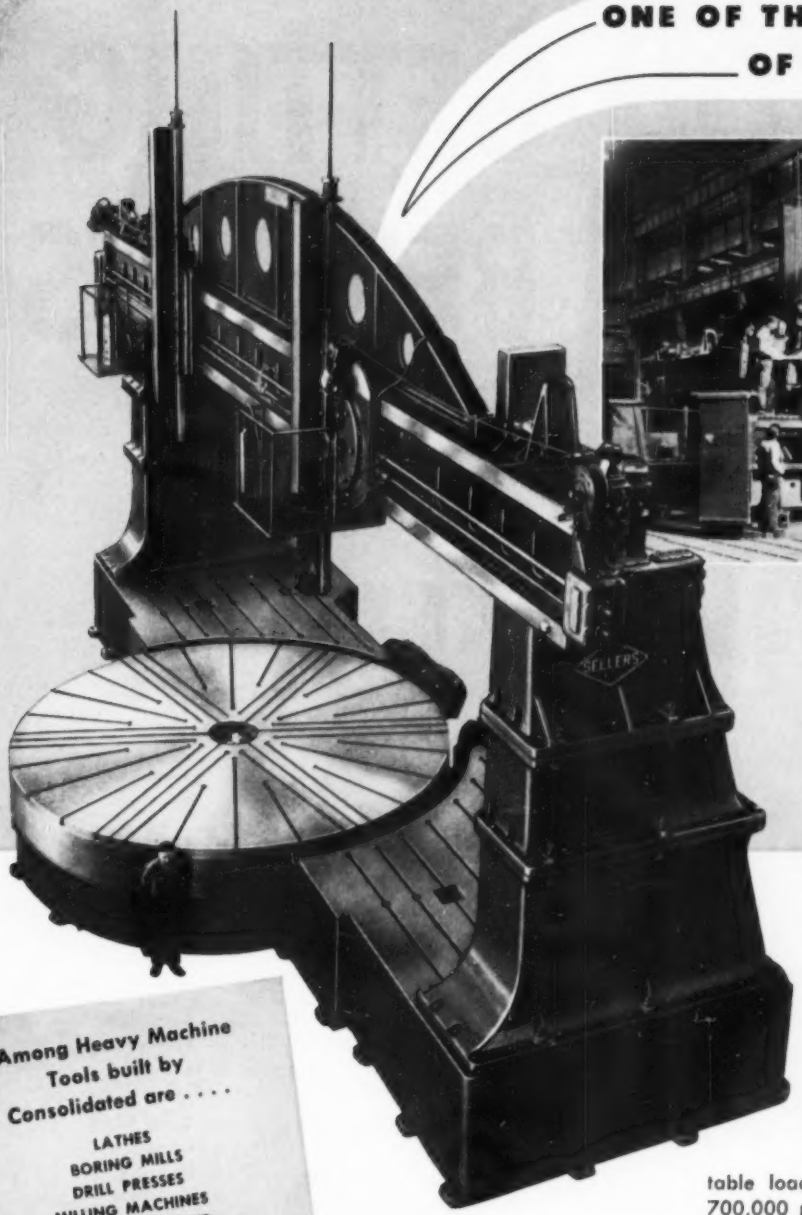
From there on, still more uses have kept turning up in this shop for Cities Service cutting oil, simply because it distinctly pays off...as it always does when a Cities Service Lubrication Engineer offers pinpointed lubricating recommendations. He draws on the c-o-m-p-l-e-t-e Cities Service industrial line, and on deep, wide experience. You can draw on *him* by writing CITIES SERVICE OIL COMPANY, Dept. A37, Sixty Wall Tower, New York City 5.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

ONE OF THE BIGGEST MACHINES OF ITS TYPE EVER BUILT



BORING LOWER BEARING BRACKET OF A WATER WHEEL GENERATOR



SELLERS 42′ VERTICAL BORING AND TURNING MILL

This gigantic boring mill, built for one of the country's largest electrical companies, is one more example of the unusually big machines designed and produced by Consolidated. It swings work 42′-2″ in diameter and up to 14′ high. Maximum table load 240,000 pounds. Weight of machine 700,000 pounds. Overall height 42′, 10′ of which is below the floor level. Crossrail is 58′ long.

Among Heavy Machine Tools built by Consolidated are . . . .

- LATHES
- BORING MILLS
- DRILL PRESSES
- MILLING MACHINES
- BORING MACHINES
- COLD SAW MACHINES
- BORING, DRILLING AND MILLING MACHINES
- DRILL AND TOOL GRINDERS
- PLANERS
- SLOTTERS
- RAILROAD SHOP TOOLS
- AUTOMOTIVE TOOLS
- AND OTHER SPECIAL MACHINES

Other huge Consolidated Machines, recently built or in process, include a Betts Special Boring and Facing Machine, weighing 300,000 pounds, and a Sellers Combination Planer-Milling Machine, weight over 645,000 pounds; together with Betts-Bridgeford 96″ Geared Head Lathes, Sellers Horizontal Boring, Drilling and Milling Machines and Hilles & Jones Plate Edge Planers weighing 250,000, 275,000 and 120,000 pounds respectively. Whether your production problems demand big or standard type machines, Consolidated is prepared to meet your requirements.

BUILDERS OF HEAVY DUTY MACHINE TOOLS SINCE 1848

BETTS • BETTS-BRIDGEFORD • COLBURN • HILLES & JONES • MODERN • NEWTON • SELLERS

CONSOLIDATED MACHINE TOOLS

CONSOLIDATED
MACHINE TOOL CORPORATION

SUBSIDIARY OF FARREL-BIRMINGHAM COMPANY, INCORPORATED

ROCHESTER, NEW YORK

ARE YOU GETTING ALL THESE BENEFITS FROM YOUR CUTTING FLUID?

....LUBRICITY
to withstand pressure and reduce friction

....VERSATILITY
one cutting fluid to do 90% of all jobs

....ANTISEPTIC PROPERTIES
no skin sores, no rancid odors

....FILM STRENGTH
which gives you longer tool life

....COOLER WORK
which can be handled bare-handed

....LOWER COSTS
less than 8¢ a gal., in the machine

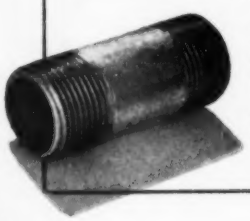
YOU GET THEM ALL WITH

ANTISEP
ALL-PURPOSE BASE
—not a mere water soluble oil, but a fortified concentrate scientifically developed to give you "100 oils in one!"

ANTISEP doubles tool life for Portland manufacturer —at 1/5 the cost of oil!

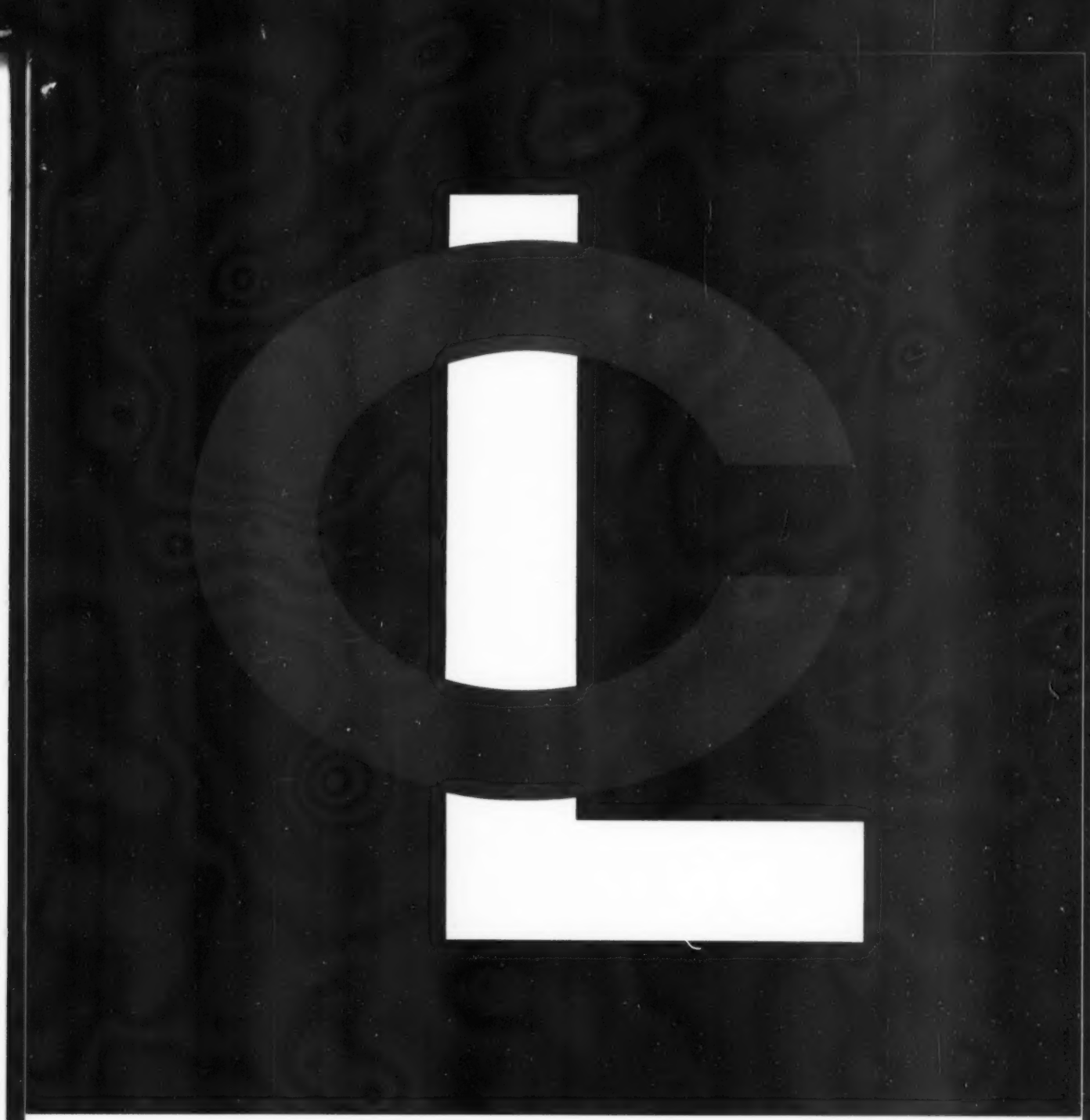
Operation consists of forming, threading and tapping stainless steel pipe nipples from 316, 340 and 303 type steel. This company switched from straight oil—costing 42¢ per gallon—to Antisep A.P. Base mixed one part to 30 with water—at a cost of about 8¢ per gallon.

LATEST REPORT—"Getting better finish—tool life doubled—at 1/5 the cost of oil formerly used." Their operators also like Antisep because there's no smoke and work comes off clean.



E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

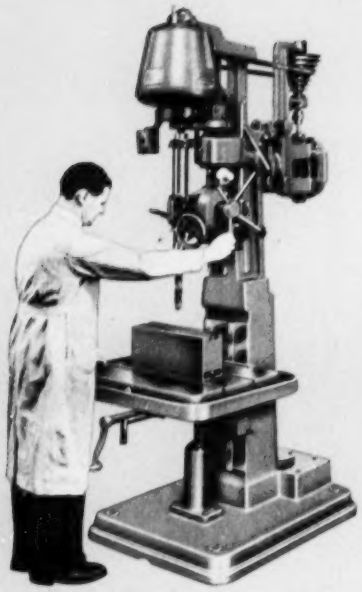


Cincinnati Lathes and Drilling Machines are so advanced that they deserve a new trade-mark — and here it is. You'll find it easy to remember, and well worth remembering. It stands for the company which designs, engineers, builds and backs up the most modern line of light and medium duty lathes (engine, toolroom and gap bed models) as well as drilling machines to cover practically all your drilling requirements. Write for catalogs and the name of your nearby CL dealer. He's always at your service.

best buys in their class!

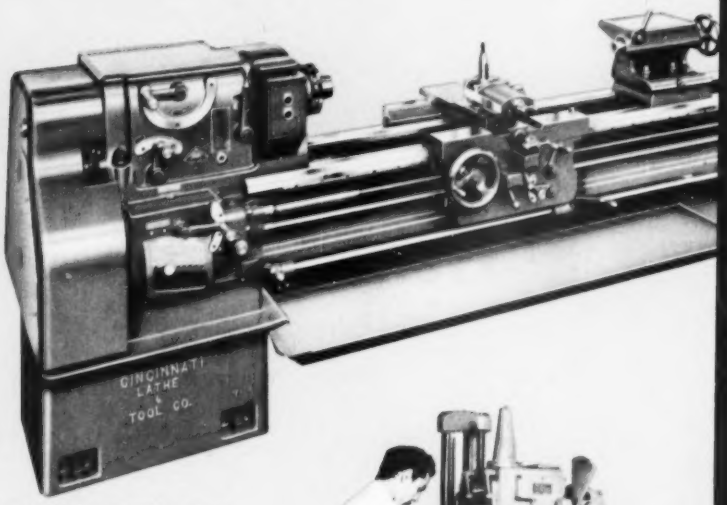
CINCINNATI LATHE & TOOL CO.

CINCINNATI 9, OHIO, U. S. A.

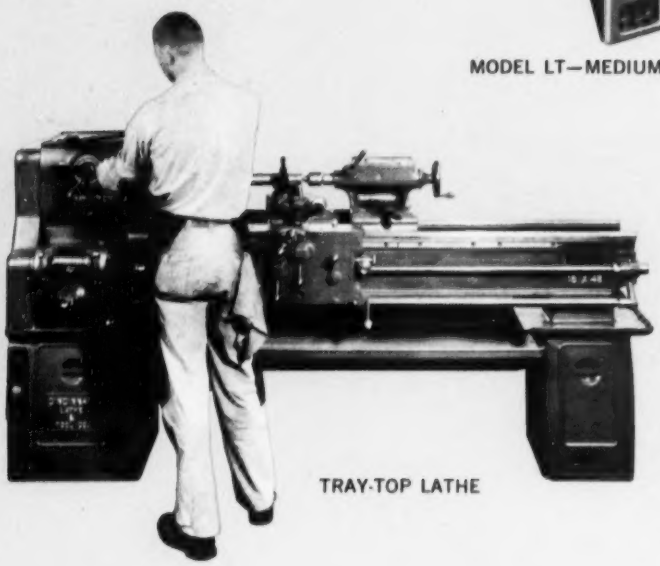


21" SLIDING HEAD BOX COLUMN FLOOR DRILL

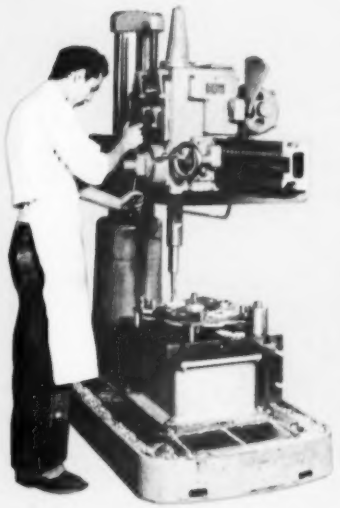
CINTIDRILLS: The complete, balanced line of drilling machines for all your drilling requirements for holes 1" OD and under. Complete line includes 3'-7" Radial, 21" Sliding Head (Box or Round Column), 21" Stationary Head, 16" 5000-10000 RPM, 16" 3000 RPM, 14" 3000 RPM for medium duty, 16" and 18" Royals for light duty. Bench, floor, and multi-spindle models. Nationally distributed.



MODEL LT—MEDIUM DUTY LATHE



TRAY-TOP LATHE



3' ARM, 7" COLUMN RADIAL DRILL

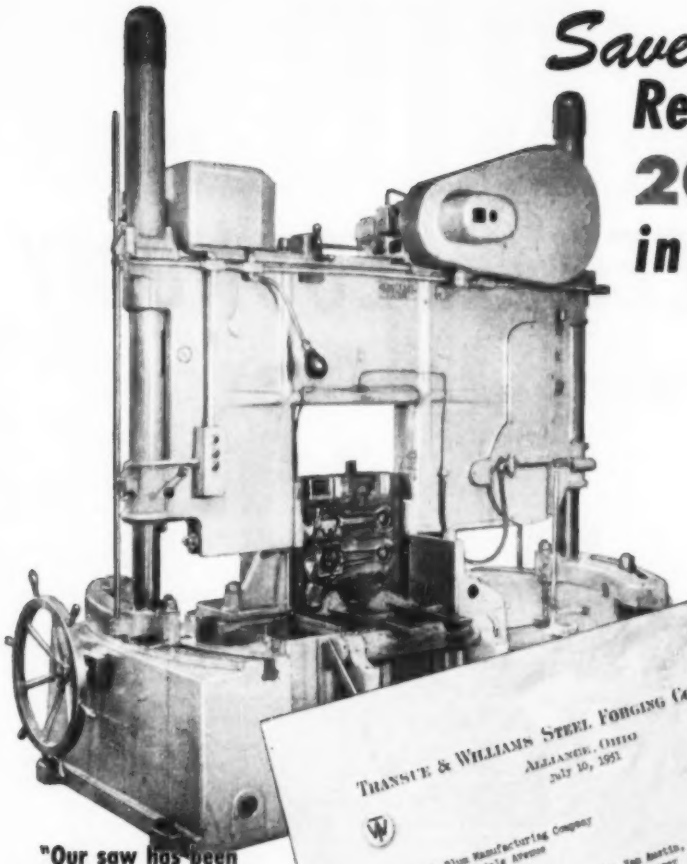
CINTILATHES: The complete, balanced line: Tray-Top for light duty (engine, tool room and gap bed models), Model LT for medium duty (engine and gap models). All geared headstocks, flame-hardened and ground bedways, and many other fine features at minimum investment.
Swing sizes: Tray-Top—10", 12½", 15", 18", Model LT—16", 18", 20", 24".
Write for catalogs and name of your nearest dealer.

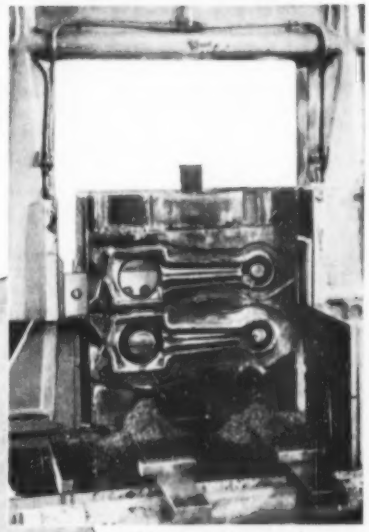
best buys in their class!

CINCINNATI LATHE & TOOL CO.

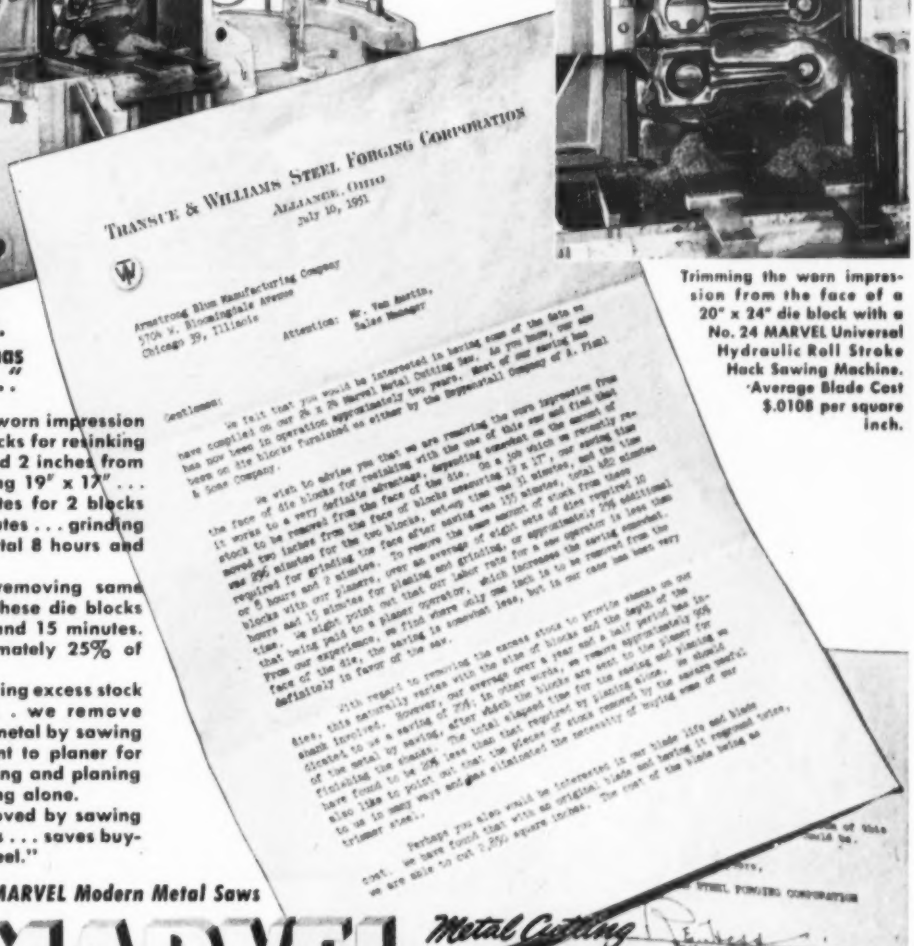
CINCINNATI 9, OHIO, U. S. A.

Save 25% Time in Re-facing Dies... 20% Time -plus steel- in Shanking Them





Trimming the worn impression from the face of a 20" x 24" die block with a No. 24 MARVEL Universal Hydraulic Roll Stroke Hack Sawing Machine. Average Blade Cost $.0108 per square inch.



TRANSUE & WILLIAMS STEEL FORGING CORPORATION
ALLIANCE, OHIO
July 10, 1951

Armstrong Blum Manufacturing Company
5700 W. Bloomingdale Avenue
Chicago 39, Illinois

Attention: Mr. Van Austin, Sales Manager

Gentlemen:

We feel that you would be interested in having some of the data we have compiled on our 24 x 24 Marvel Metal Cutting Saw, as you know, our saw has now been in operation approximately two years. Most of our sawing has been on die blocks furnished us either by the Ingersoll Company of A. Finn & Sons Company.

We wish to advise you that we are removing the worn impression from the face of die blocks for reinking and recently removed 2 inches from the face of blocks measuring 19" x 17" . . . sawing time 296 minutes for 2 blocks . . . Set up time 31 minutes . . . grinding time 155 minutes . . . total 8 hours and 2 minutes.

"Average time for removing same amount of stock from these die blocks with planer, 10 hours and 15 minutes. Sawing saves approximately 25% of time . . .

"With regard to removing excess stock to provide shanks . . . we remove approximately 90% of metal by sawing after which block is sent to planer for finishing. Time for sawing and planing is 20% less than planing alone.

"Pieces of stock removed by sawing are useful in many ways . . . saves buying of some trimmer steel."

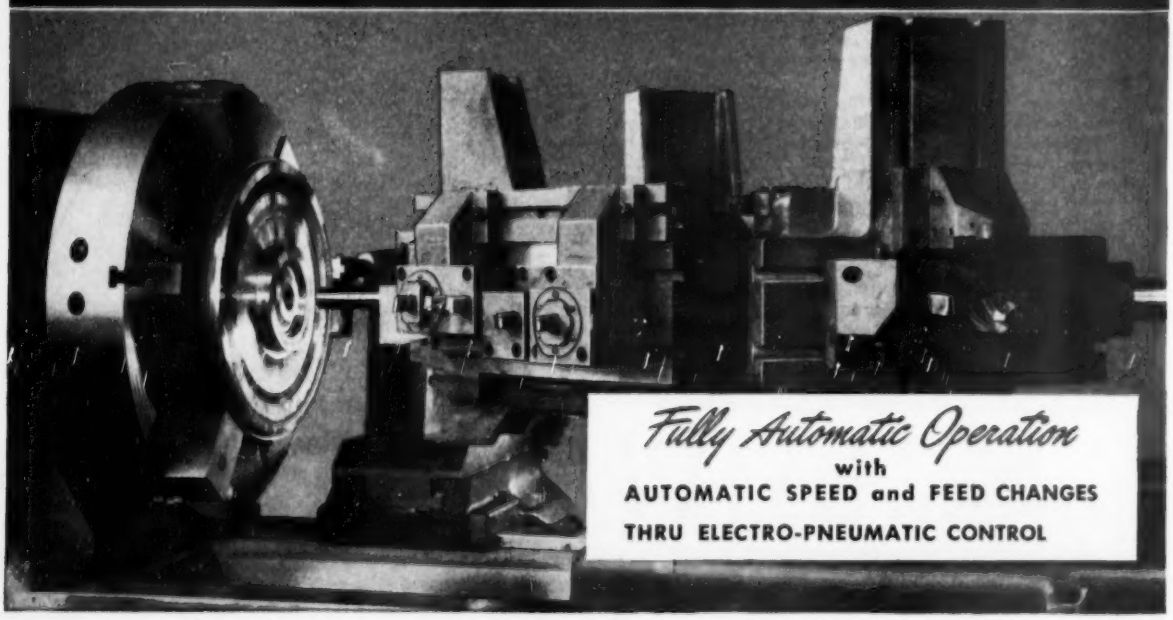
"Our saw has been in operation 2 years. Most of our sawing has been on die blocks..."

Write for Catalog of MARVEL Modern Metal Saws

MARVEL Metal Cutting SAWS
Better Machines-Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 W. BLOOMINGDALE AVE. CHICAGO, (39) U. S. A.

HANDLE YOUR BIG JOBS WITH NEW *SPEED* AND *ECONOMY* ON THE POTTER & JOHNSTON 10-U AUTOMATIC *Turret Lathe*



Fully Automatic Operation
with
AUTOMATIC SPEED and FEED CHANGES
THRU ELECTRO-PNEUMATIC CONTROL

New Productivity

in the manufacture of . . .

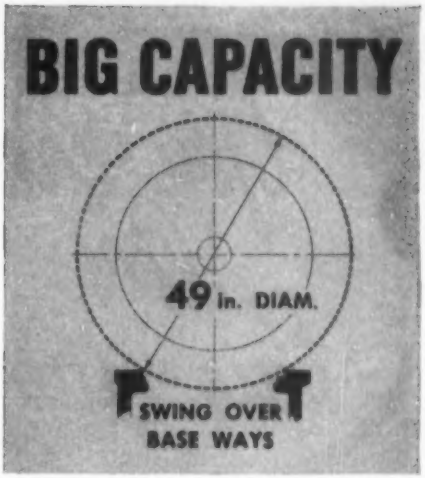
- AGRICULTURAL, EARTH MOVING AND AUTOMOTIVE EQUIPMENT
- AVIATION JET ENGINES
- BIG ELECTRICAL MOTORS
- ORDNANCE COMPONENTS

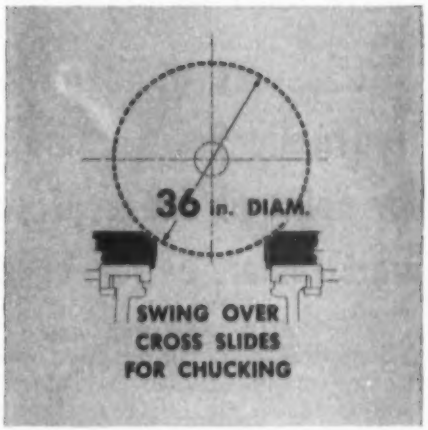
. . . AND ALL LARGE CHUCKING WORK

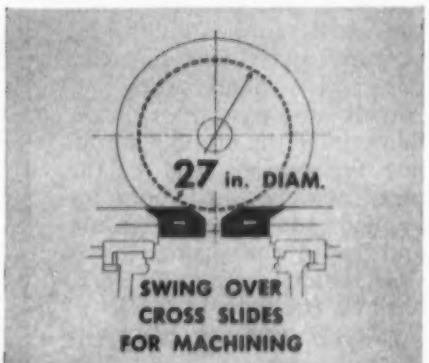
The big, powerful, new Potter & Johnston 10-U Turret Lathe now brings the advantages of fully automatic operation to your really big, hard-to-handle jobs, like this large-diameter disk for an aircraft jet engine—shown here mounted in a 36 inch chuck. The P&J-designed tooling takes full advantage of simultaneous multiple cuts to produce the finished work piece.

The P&J 10-U is equipped with a 75 horsepower motor, multi V-belt drive and air operated chucks. Controls are centralized in a single, convenient station. All mechanisms including the clutches are readily accessible for adjustment.

If you're doing big jobs, you'll want more information on the Potter & Johnston 10-U Automatic Turret Lathe. Send today for your copy of Bulletin 146. Write on your Company letterhead to the Pratt & Whitney Branch Office nearest you — or direct to Pawtucket, R. I.







POTTER & JOHNSTON CO.
PAWTUCKET, RHODE ISLAND
SUBSIDIARY OF
PRATT & WHITNEY
DIVISION NILES – BEMENT – POND COMPANY

P&J

You can't lick this stamp!

. . . It was done on a KRW Hydraulic Press . . . famous for doing all kinds of stamping work faster, better, at less cost!

Sometimes minor production operations can become major headaches. Take the case of Buffalo Meter Co., makers of water, oil and specialty meters. Stamping the serial number on the lid of each meter was formerly done on a hand press and caused no end of trouble. Sometimes the number would not register exactly on the plate; sometimes the operator applied too much pressure and the lid was sprung. It was slow, tedious, inaccurate work, hard on the operator.

Buffalo Meter solved the problem with a 25 ton KRW Motor Driven Hydraulic Press. Now one man can stamp upwards of 300 meter lids per hour — more than four times as many as before. Each number is in perfect register. And there are no more sprung lids because each stroke of the KRW press produces exactly the same amount of pressure. It's a small job, but it illustrates the value of a KRW hydraulic press for any stamping job.

Any stamping or other pressing problems in your plant? Check with KRW. We have a full line—25 to 150 ton capacities; one, two and three cylinder models; hand operated, air operated or motor driven. If you need a *special* press, we'll build it for you.

Call your local Machinery dealer; or write, wire or phone Dep't. 11 for facts, prices and delivery dates.

SINCE 1916 KRW A MARK OF DEPENDABILITY

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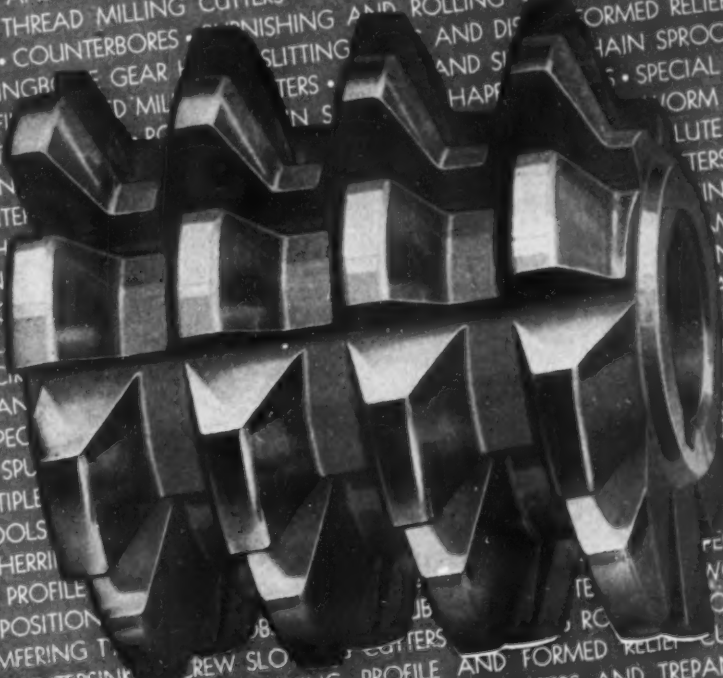
215 MAIN STREET · BUFFALO 3, N. Y.

Designers and builders of Hydraulic Presses to meet any metal-working problem

FOR THOSE TOUGH Special JOBS

...DEPEND ON

National Tool Co.



● Years of successful experience in *special* tooling and related production problems are yours for the asking. When the job requires *special* cutting tools call in your National Tool Co. representative. He is backed by more than 46 years experience in the engineering and manufacture of *special* cutting tools. His assistance is yours, without obligation, whether you're interested in one tool or a complete tooling program.

Since 1905 engineers and manufacturers of high-quality special cutting tools for the metal-working industry

National Tools Cleveland

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TOOL CO.
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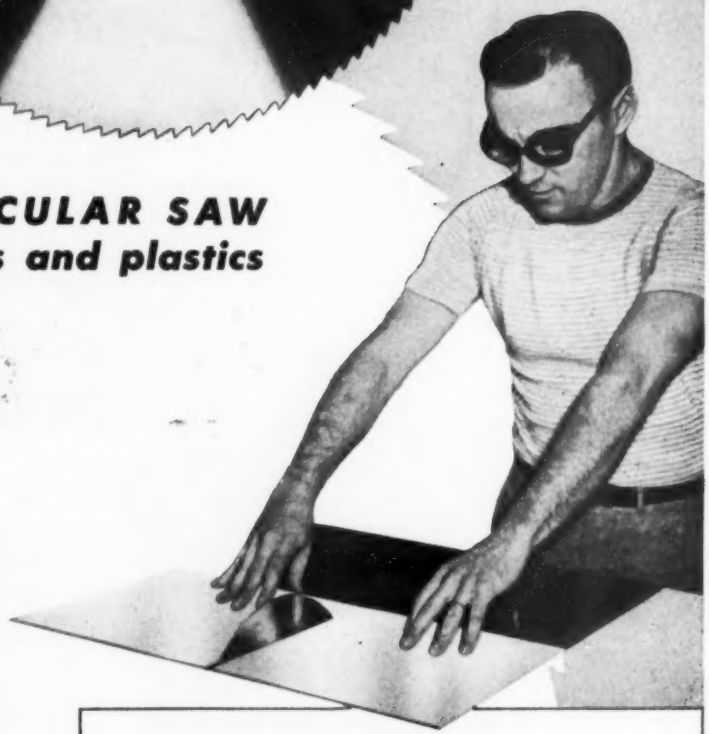
Another great new DISSTON product

Diss-Croloy CIRCULAR SAW
for non-ferrous metals and plastics

Here's a new saw designed to give more cuts per saw dollar. It is carefully made from tough, high-carbon, high-chrome Disston steel . . . with edge-holding qualities superior to any steel saw heretofore available.

Diss-Croloy Circular Saws have a longer cutting life, and require less frequent sharpening...minimizing downtime losses. This means more and better cuts from each blade, with a considerable reduction in sawing costs.

The new Diss-Croloy Circular Saw is made in 6″, 8″, 10″, 12″, 14″, and 16″ diameters. You can use it to cut any non-ferrous metal (such as copper, brass, aluminum, magnesium, bronze) or plastics (as Formica, Masonite, Lucite, Plexiglas, Micarta). Give one of these amazing, economical saws a trial. You can count on them for better quality, higher production and lower costs.



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HENRY DISSTON & SONS, INC.

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It's the SPINDLE That Does The Work

on SURFACE GRINDERS

specify **POPE P32-T** Direct Motorized Cartridge Type with strong, oversize 1 HP, 3450 RPM totally enclosed motor.

POPE

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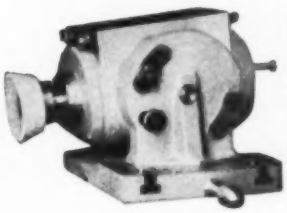
specify the NEW series of **POPE** belt driven, cartridge type Precision Internal Grinder Spindles, up to 54,000 RPM, with chrome plated, stationary cap in place of the old, revolving type.

It's the SPINDLE That Does The Work

on TOOL and CUTTER GRINDERS



specify **POPE P-6651-A** 3600-RPM Motorized Tool and Cutter Grinder Head with angular adjustment in a vertical plane.

POPE

on GRINDING, MILLING, BORING

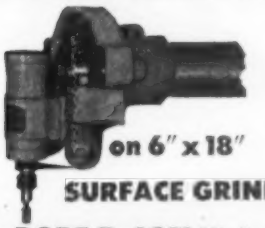
specify **POPE P-2500** Heavy Duty Direct Motorized Spindle for grinding, milling, boring —¾ to 100 HP.

It's the SPINDLE That Does The Work

on WHEEL HEADS

specify **POPE P-12004** Heavy Duty Vee-Belt Driven Machine Wheel Head for up to 4000 RPM— ½ to 50 HP.

POPE



on 6" x 18" SURFACE GRINDERS

specify **POPE P-6351** High Speed Vertical Spindle Attachment for 6" x 18" Surface Grinders — 15,000 RPM.

It's the SPINDLE That Does The Work

★ *For complete specifications, prices and delivery estimates on these and the many other Precision Spindles on which the quantity and quality of a machine's production so largely depends, get in touch with*

No. 90

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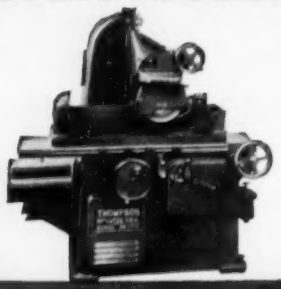
POPE MACHINERY CORPORATION
ESTABLISHED 1910
261 RIVER STREET • HAVERHILL, MASSACHUSETTS
BUILDERS OF PRECISION SPINDLES

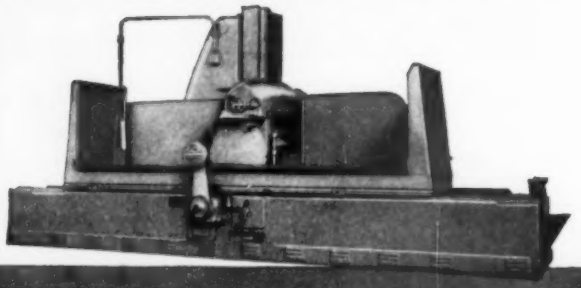
Save Time and Money ... Select

THOMPSON

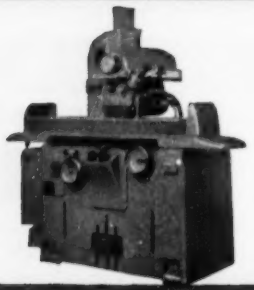
HYDRAULIC SURFACE AND CONTOUR GRINDERS



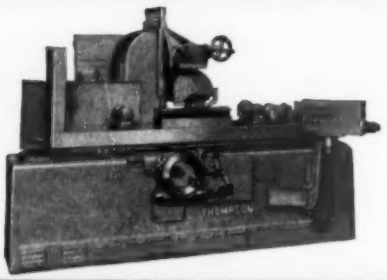
TYPE B



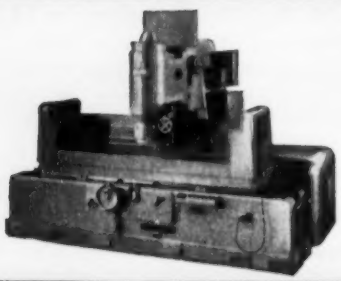
TYPE C & CX

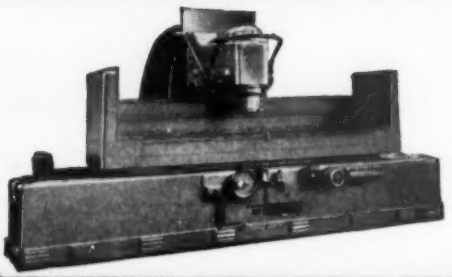


TYPE F



TYPE B & C TRUFORM





HYDROVERT

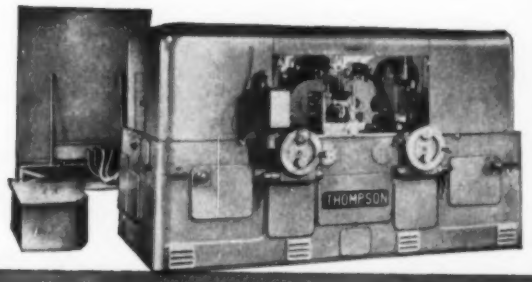
Write Thompson today for details . . .

1 **WIDEST RANGE** of light and heavy duty Surface and Contour Grinders

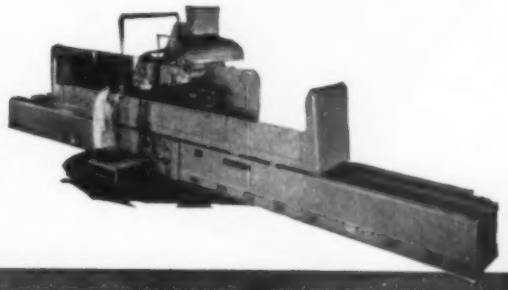
2 **HIGHEST ACCURACY** for lower costs

3 **PROVED QUALITY** for longer service

4 **SPECIAL MACHINES** for any surface and contour grinding application

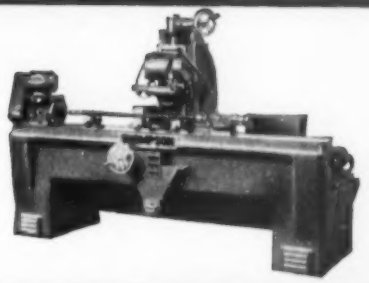


DOUBLE WHEEL BUCKET AND BLADE GRINDER

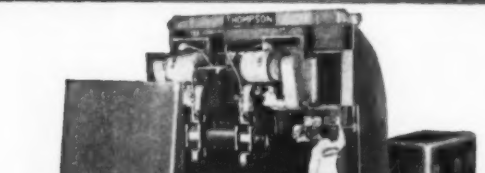


WAY GRINDERS

TWIN CHUCK ROTARY GRINDER For grinding circular metal discs 6 to 12 inch and 6 to 36 inch sizes



NEW MODEL 600 MANUAL KNEE-TYPE GRINDER



RAIL TYPE HYDRAIL Widest grinder ever built

Thompson SURFACE Grinders

The Thompson Grinder Co., Springfield 1, Ohio

Designed for **every** drilling need

(particularly the need to cut production costs)

new WALKER-TURNER

LIGHT-HEAVYWEIGHT

DRILL PRESSES

15" DRILL PRESS
with 6" Travel
(1300 Series)
BENCH MODEL
(Cap. 0 to ½")
Available also in Floor
and Multi-spindle Models

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with 4" Travel
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15 Spindle Speeds
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spindle travel available
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Hand or Power Feed
MULTI-SPINDLE MODEL
(Cap. 0 to 1")
Available also in Bench
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about Walker-Turner Drill Presses, write your name and address in the space below, indicating type of Drill (15", 20", Radial) in which you are interested.

. . . . **Use this space** . . . . .

to write for full details and specifications.
Walker-Turner Division, Kearney & Trecker Corp.
Dept. AM-11, Plainfield, N. J.

(Please write your name and address in margin of page)

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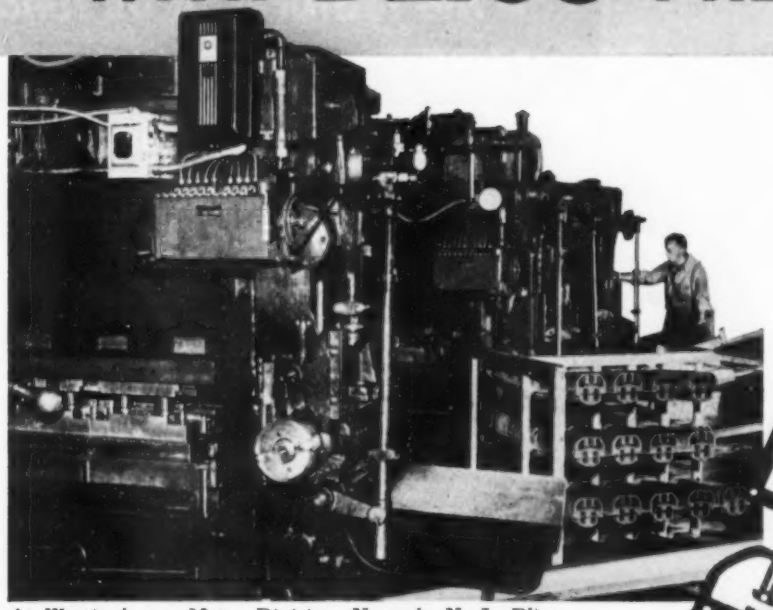
DRILL PRESSES • RADIAL DRILLS • TILTING ARBOR SAWS • BELT and DISC SURFACERS
METAL-CUTTING BAND SAWS • LATHES • SPINDLE SHAPERS • JOINTERS

The trend is to more stampings WITH BLISS PRESSES...



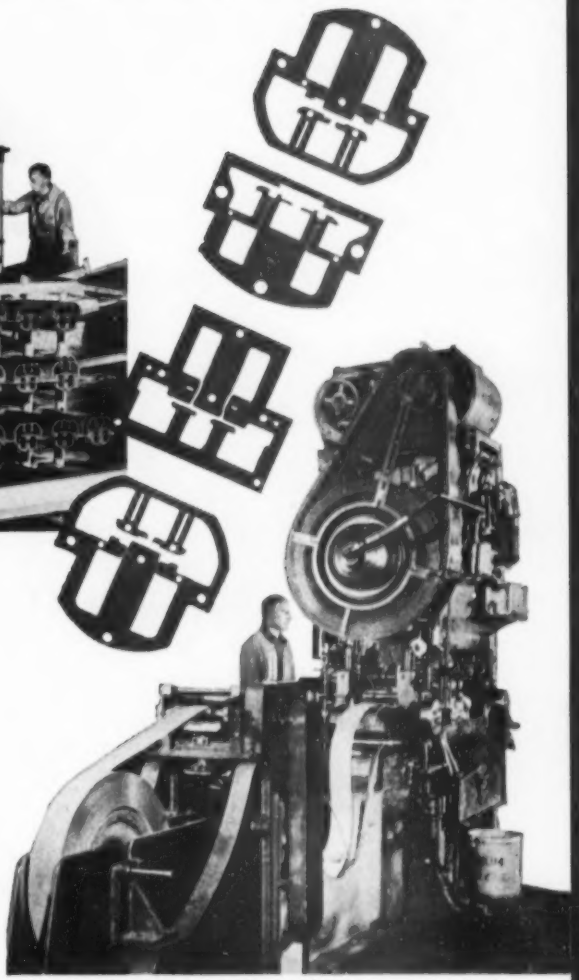
At Westinghouse Meter Division, Newark, N. J., Bliss Automatic Lamination line of four No. 645 High-Production Presses, operating at speeds in excess of 200 strokes per minute, steps up meter lamination production.

Westinghouse gets 800 laminations a minute from 4 BLISS Automatic Presses

To keep pace with stepped-up meter production, Westinghouse relies on a battery of four Bliss High-Production Presses for lamination stampings.

Production is fully automatic: 0.017 in. steel feeds from a Bliss-built coil cradle, through a double-roll feed into a six-station die. The stampings are stacked; the scrap is pulled through and trimmed...all at a rate of 200 strokes per minute.

These Bliss No. 645 Presses are but four of the 80 Bliss presses on the job at Westinghouse. That's because Bliss builds the most complete range of pressed-metal machinery available anywhere.



This completely automatic production unit includes coil cradle, roll straightener, double-roll feed, high-production shear and scrap press. For details on Bliss presses, write for "The Dominant Factor."

E. W. BLISS COMPANY, CANTON, OHIO

E. W. Bliss (England) Ltd., Derby, England

E. W. Bliss Company (Paris), St. Ouen sur Seine, France

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. **West Coast Representatives:** Moore Machinery Company, Los Angeles and San Francisco; Star Machinery Company, Seattle. **Other dealers** in U.S. cities and throughout the world.

BLISS

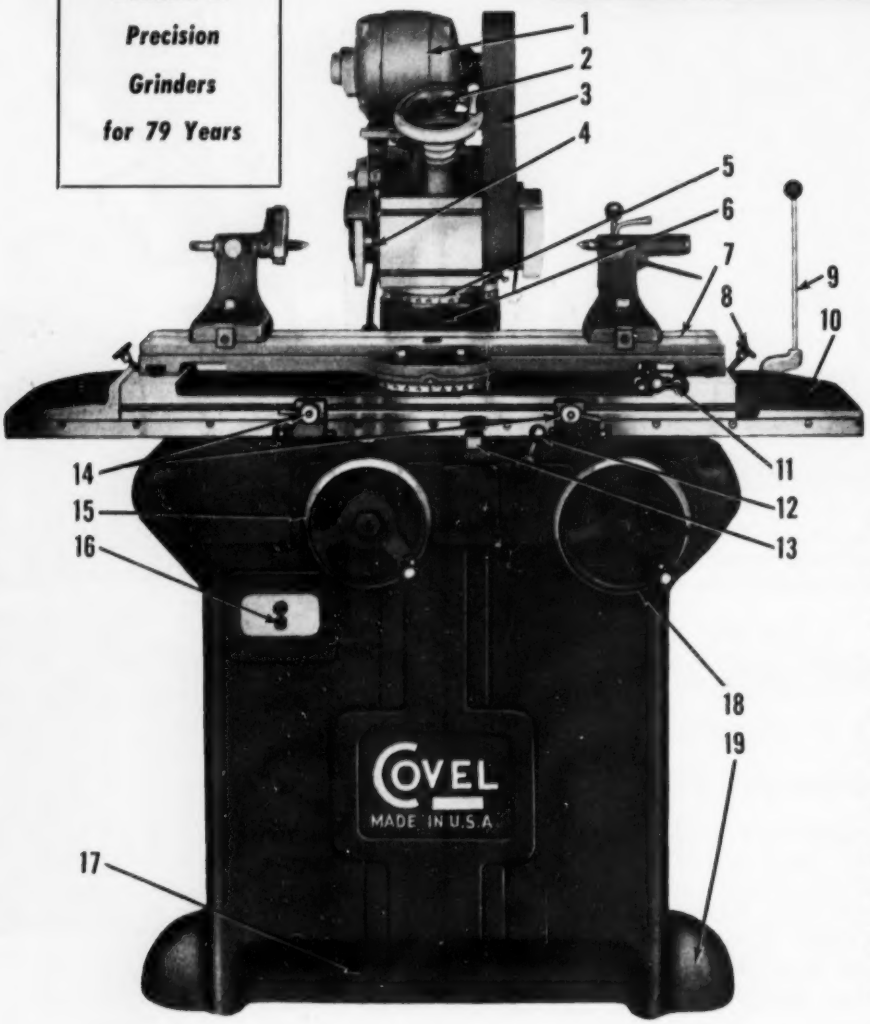
on your press is more than a name...it's a guarantee!

COVEL NUMBER 12

UNIVERSAL CUTTER AND TOOL GRINDER

all the features in its field — and moderately priced!

Builders of Precision Grinders for 79 Years



FOR SPEED, ACCURACY, LOW-COST PRODUCTION, EASE OF OPERATION

1. ¾ HP spindle drive motor conveniently located. Two-speed flat belt drive.
2. Elevating hand wheel with floating dial.
3. Belt guard easily removed.
4. Quill-type ball bearing spindle. Large, rugged and accurate. (Reversible optional.)
5. Head swings on vertical adjustable column (graduated).
6. Telescoping metal dust guards
7. Top table adjustable for taper grinding. Can be revolved 180° to increase capacity 3".
8. Quick-acting end clamps.
9. Hand-rapid table traverse lever is adjustable, convenient.
10. Table moves on anti-friction ball-bearing ways.
11. Fine screw table adjustment for taper.
12. Lock for sub-table (saddle and column locks also provided).
13. Table stops slide back, permitting dogs to pass.
14. Fine screw adjustable table dogs for limiting table travel.
15. Large graduated cross feed hand wheel with pointer.
16. All electric controls are convenient to operator.
17. Toe-room in front of base for operator comfort.
18. 2-speed hand wheel for longitudinal table travel.
19. Covers over hold-down bolts.

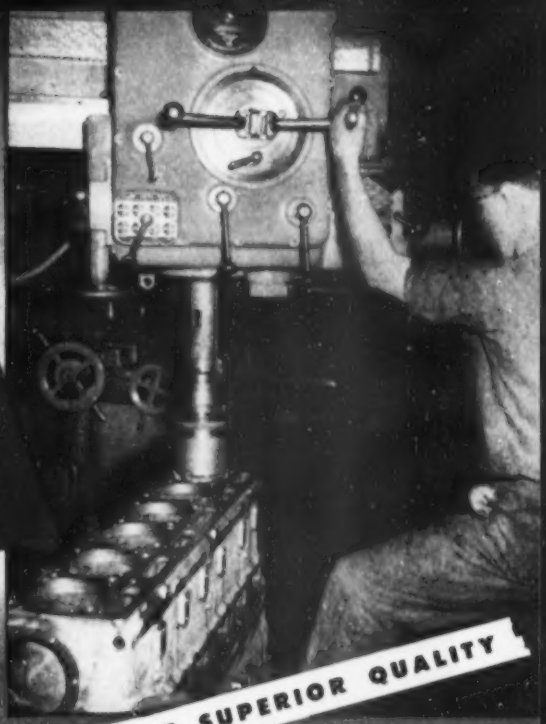
COVEL PRECISION GRINDERS

BENTON HARBOR, MICHIGAN

Write for **BULLETIN AM-153**

DRILL GRINDERS • UNIVERSAL CUTTERS & TOOL GRINDERS • HYDRAULIC & HAND FEED SURFACE GRINDERS

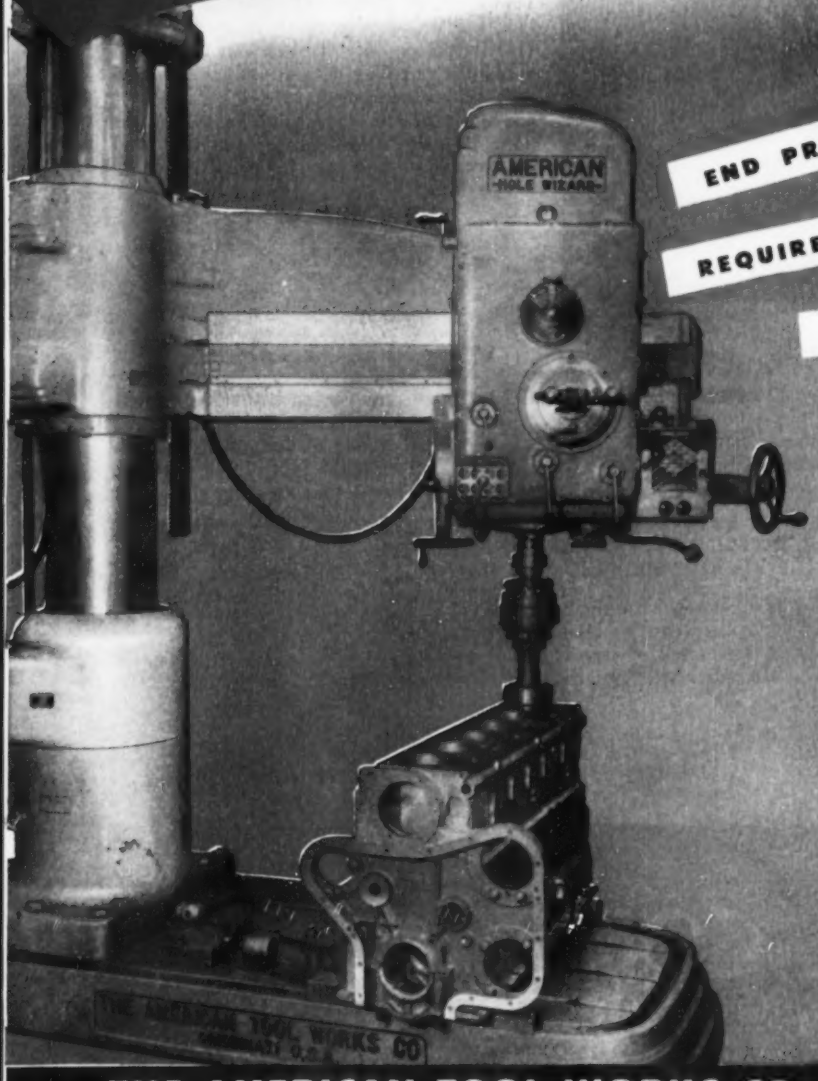
The 2 are inseparable—



END PRODUCTS OF SUPERIOR QUALITY

REQUIRE SUPER QUALITY EQUIPMENT

TO PRODUCE THEM . . .

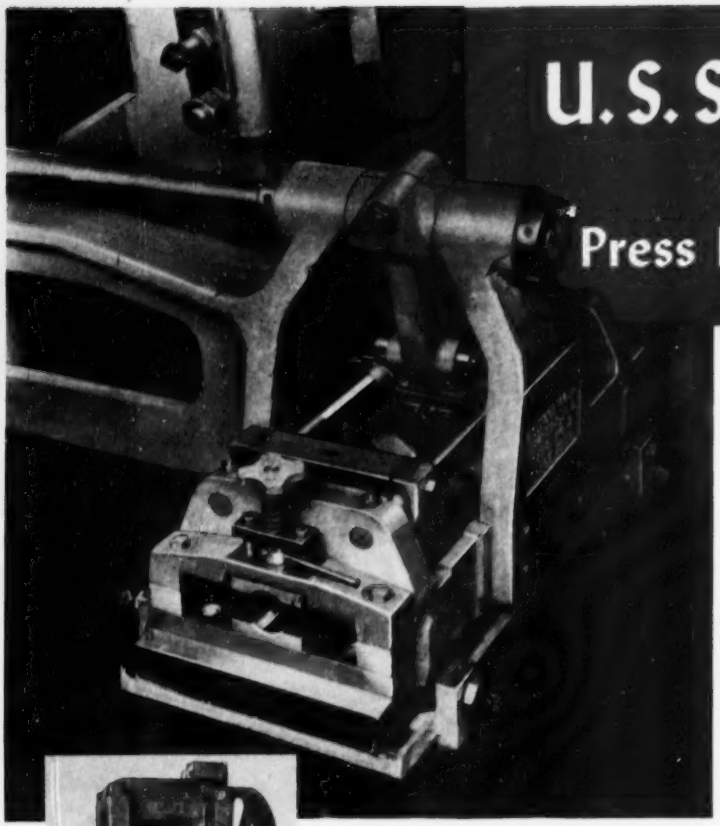


For six years this "AMERICAN" Hole Wizard Radial has been counterboring "Cummins" Diesel Engine Blocks and holding the required depth tolerance of .001" in the 6.125" counterbores. Furthermore, the operator testifies to the fact that the machine is convenient and easy to operate and maintenance has been negligible.

The quality of "Cummins" products is universally recognized. We are proud indeed that so many "AMERICAN" Lathes and Radial Drills contribute to it.

THE AMERICAN TOOL WORKS CO. Cincinnati 2, Ohio, U. S. A.

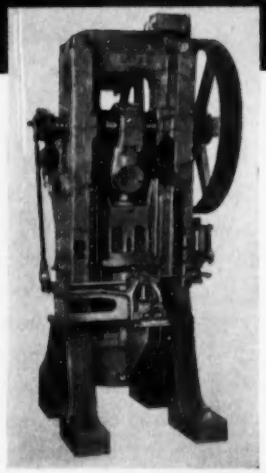
LATHES AND RADIAL DRILLS



U. S. Slide Feeds Solve Your Press Room Problems

For Example . . .

The Cleveland Punch and Shear Works Co., Cleveland, Ohio, received an order from The Metal Specialty Company of Cincinnati to furnish a number of their presses equipped with automatic feeds to feed 1⅜" diameter bar stock into the press for a cut-off operation. Because of the nature of the job and the accuracy required, U. S. Slide Feeds were selected.



Accuracy . . .

With the set-up illustrated, the accuracy of feed length must be such that the weight of the cut-off pieces be within closely controlled limits. The U. S. Slide Feed advances the 1⅜" diameter bar stock into the die ¾" at each stroke of the press, and the weight of the cut-off pieces varies less than one gram! With the U. S. Slide Feed the travel of the feed block is constrained between positive stops, thus assuring controlled accuracy.

Versatility . . .

U. S. Slide Feeds are known for their accuracy in feeding flat stock from coils, but as described above, they can be used with equally satisfactory results for feeding round wire, bars, and stock of irregular cross-section. And in addition to metals, U. S. Slide Feeds can be used for feeding materials such as paper, plastic, mica, etc.

If you have a press feed problem, ask for a copy of Bulletin 80-A on U. S. Automatic Press Room Equipment. It contains illustrations and descriptions of U. S. Slide Feeds, Straighteners, Stock Reels, Coil Cradles, Stock Oilers, Scrap Choppers, etc.

US PRODUCTS

U. S. TOOL COMPANY, Inc.

AMPERE (East Orange) NEW JERSEY

how much can you save with a Lodge & Shipley COPYMATIC

SAVINGS REPORTED BY FAMOUS MANUFACTURERS

FIRM	PART	TIME SAVINGS
Automatic Transportation Co.	Armature shaft	55%
Bay City Shovels, Inc.	Worm gear shaft	70%
Canadian Arsenals, Ltd.	Heavy spindle	60%
Harnischfeger Corp.	Pinion shaft	40%
Hydraulic Press Mfg. Co.	Valve parts	50%
Indiana Gear Works, Inc.	Helicopter gearing	50%
Link-Belt	Transmission shaft	50%
Lockheed Aircraft Corp.	Engine mount lug	87%
Magna Mills Products	Dural extrusion	33%
Norris Stamping & Mfg. Co.	Auto rim rolls	50%
D. H. Prutton Machy. Co.	Machine spindle	85%
Solar Aircraft Co.	Jet engine parts	22%
Wyman-Gordon Corp.	Aluminum extrusions	50%

If you have lathe work that's adaptable to the Lodge & Shipley COPYMATIC, there's no reason why you, too, can't enjoy savings comparable to those shown above. On every installation, owners report significant advantages. With one, it may be a time saving as high as 87%. With another, a production increase as much as 536%. Still another finds an overall saving of $14,000 in one year or the fact that one COPYMATIC replaced three older lathes.

Best of all, the COPYMATIC is so versatile, combining the speed of automatic duplication with the precision and adaptability of the famous Model X Lathe, practically any shop can use it profitably.

Write for detailed COPYMATIC case histories or a demonstration of your own parts on a COPYMATIC.

THE Lodge & Shipley COMPANY
MACHINE TOOL DIVISION • 3059 COLERAIN
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ARMSTRONG TOOL HOLDERS

answer both . . .

1. **The problem of lowering costs**
2. **The problem of increasing output**

By providing permanent, multi-purpose, inexpensive ARMSTRONG TOOL HOLDERS that use cutters or bits that are quickly ground from standard high speed shapes (Saving: All Forging, 70% Grinding and 90% High Speed Steel), the Armstrong System of Tool Holders will reduce your tool cost to an absolute minimum.

By providing stronger, more efficient tools, carefully developed for each operation, as well as ARMSTRONG High Speed Steel, ARMALOY Cast Alloy Cutter Bits or Armide Carbide-Tipped Cutters as required for each job, ARMSTRONG TOOL HOLDERS permit greatly increased speeds and feeds, enable you to increase the hourly output of every lathe, planer, slotter, shaper, turret lathe and screw machine.

There is no surer way to lower costs and increase output, than to use the correct ARMSTRONG TOOL HOLDER for each operation on all machines.

Stocked by Leading Tool Departments

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"THE TOOL HOLDER PEOPLE"

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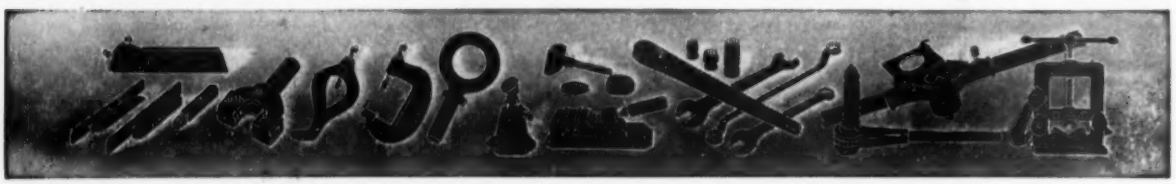
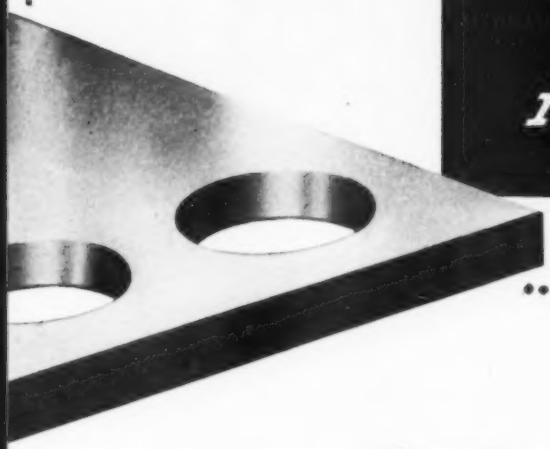
Write for Catalog.

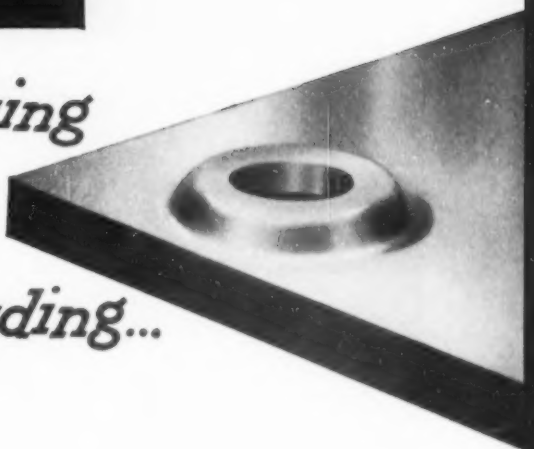


DANLY

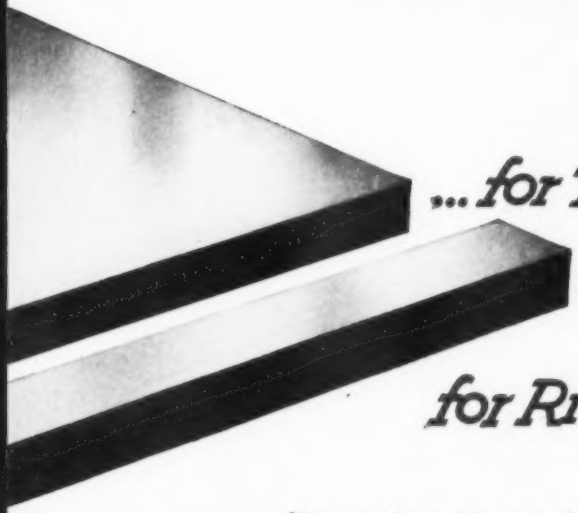
is faster!



... for Piercing



for Punch Extruding...



... for Trimming

for Riveting...

You can pierce, trim, extrude or rivet at less cost because you can do it faster with Danly Hydraulic Metalworking Equipment! Check these new cost and time saving advantages:

• ***Greater Capacity*** . . . the exclusive Danly hydraulic system minimizes break-through shock and permits smoother operation at higher pressures. You can pierce holes smaller in diameter than the thickness of your steel!

• ***Automatic Stripping Action*** . . . set-up and operation are greatly simplified because blank-holding and stripping action is an integral part of the Danly power cylinder cycle . . . completely hydraulic.

• ***Less Down Time*** . . . hardened and ground wear surfaces and extra long guides assure maximum tool life. Springs and rubber cushions, a major cause of failure, are eliminated.

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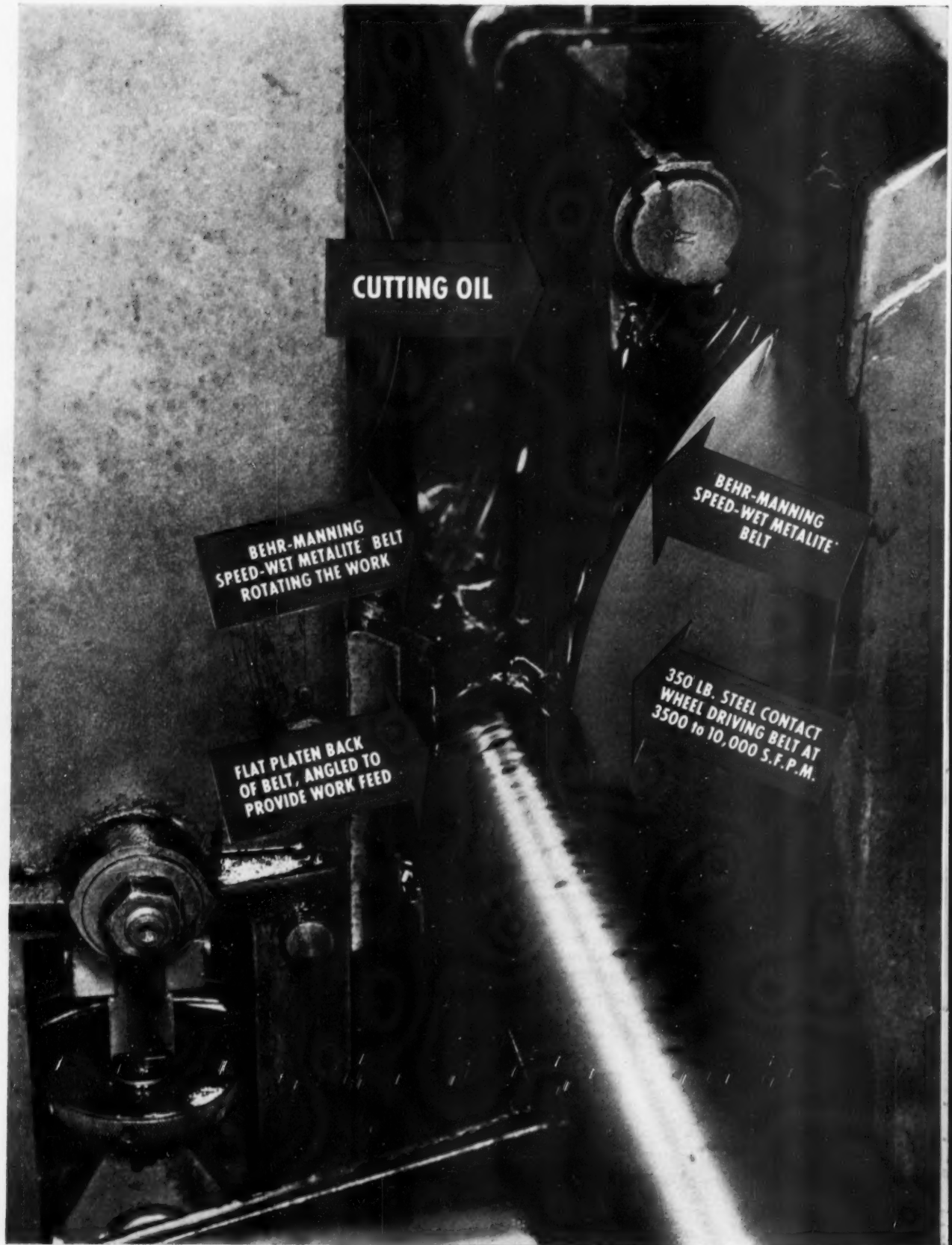
HYDRAULIC METALWORKING EQUIPMENT
MECHANICAL PRESSES...50 TO 3000 TONS

Application possibilities are almost unlimited because Danly Hydraulic Metalworking Equipment is engineered to meet your specific needs. Write today for complete information.


CUTTING OIL
BEHR-MANNING SPEED-WET METALITE BELT ROTATING THE WORK
BEHR-MANNING SPEED-WET METALITE BELT
350 LB. STEEL CONTACT WHEEL DRIVING BELT AT 3500 to 10,000 S.F.P.M.
FLAT PLATEN BACK OF BELT, ANGLED TO PROVIDE WORK FEED

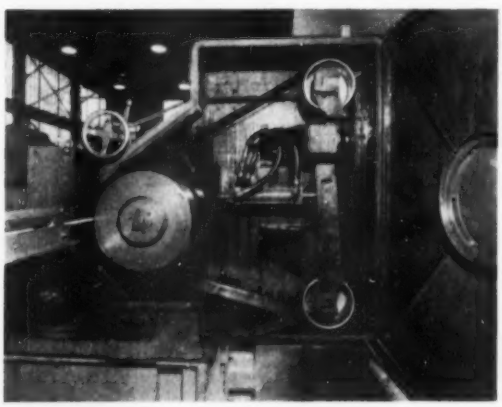
Talk about stock removal!

BEHR-MANNING SPEED-WET® METALITE® BELT REDUCES ROUND STOCK...

One pound per minute!

Here's precision grinding history in the making—a new centerless grinding machine which applies the great stock removal qualities of BEHR-MANNING METALITE Belts. The 9-in. wide grinding belt is lubricated with cutting oil, and runs over a 20-in. diameter steel contact wheel which weighs about 350 lbs. Surface speed of the belt is from 3500 to 10,000 f.p.m.

The workpiece is revolved and fed across the grinding belt by a SPEED-WET METALITE regulating belt operating over a flat steel platen. The regulator belt is ¾-in. wider than the grinding belt, to start rotation of the work before it reaches the grinding belt. The work in this case was 15-ft. rounded stainless steel tubes. Tubes were weighed before and after grinding, disclosing the startling result of 1 lb. per minute in weight of stock removed.



GRINDING BELT AND CONTACT WHEEL HOUSING WITH COVER SWUNG BACK. NOTE HYDRAULIC BELT TENSION DEVICE.

It is significant that in the test run of twelve tubes, *the original belt removed as much stock during the last pass of the twelfth tube as at the first pass of the first tube.* The almost incredible production speed was obtained largely on (1) the ability of the resin anchoring of the abrasive grains to stand up to the work in spite of the very heavy pressure involved; (2) the hardness of the grains, maintaining their cutting edges undiminished after much work; and (3) the belt's cool-cutting qualities, further helped by the action of the cutting oil.

The process is applicable to any bar or tubular stock. The machine was built by Production Machine Co., Greenfield, Mass.

THIS WILL EXPEDITE YOUR WORK

If you want to find out, check with your nearby BEHR-MANNING Field Engineer about it—or about any other grinding or polishing problem you may have. For general information read "Blueprints for Production"—a review of new methods which may easily save you money. Write Behr-Manning Corp., Troy, N. Y., Dept. AM-1.

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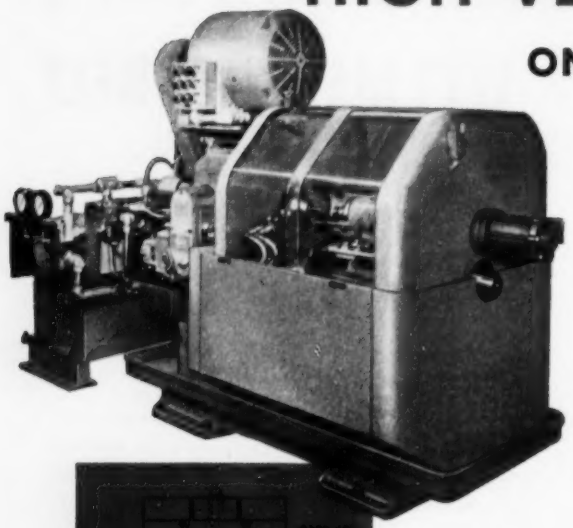
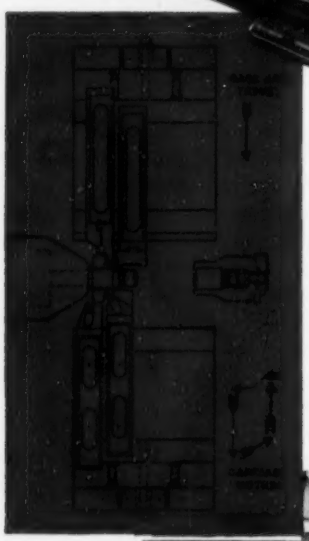
AUTOMATICITY BACKS UP HIGH VELOCITY TURNING ON FAY AUTOMATICS





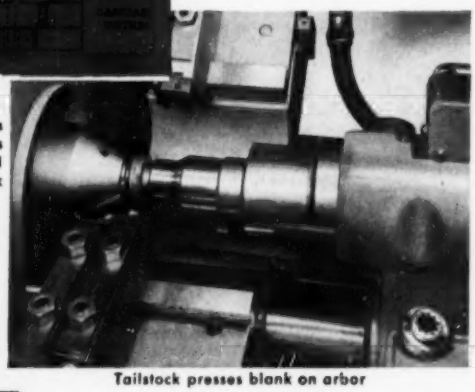
SIDE GEARS
18 Seconds Floor to Floor — 635 SFM

Two 8" Fays, with Automatic Sequential Control, machine all exterior surfaces of the blanks in two operations; one machine for each. The major diameter is 2-15/16" and floor to floor time is approximately 18 seconds in each operation.

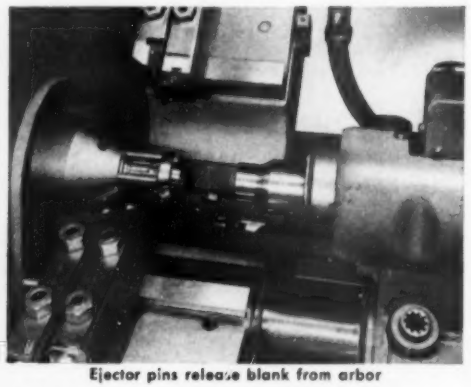
Automatic Cycle—The machines are equipped with automatically operated splash guards and automatically air-operated tailstock rams for pressing the blank onto a splined arbor equipped with automatically operated ejector pins.

The operator places the blank on the end of the arbor, and pushes the cycle start button. *Automatically, the guard closes, the tailstock ram presses the piece onto the arbor and then retracts. The carriage turns, the back arm faces, and at the end of the cuts, ejector pins push the piece onto the loading section of the arbor* from which it is removed manually.

FIRST OPERATION: Note intricate movements of the carriage, which turns the hub, back angle and major diameter. The back arm faces and forms.



Tailstock presses blank on arbor



Ejector pins release blank from arbor

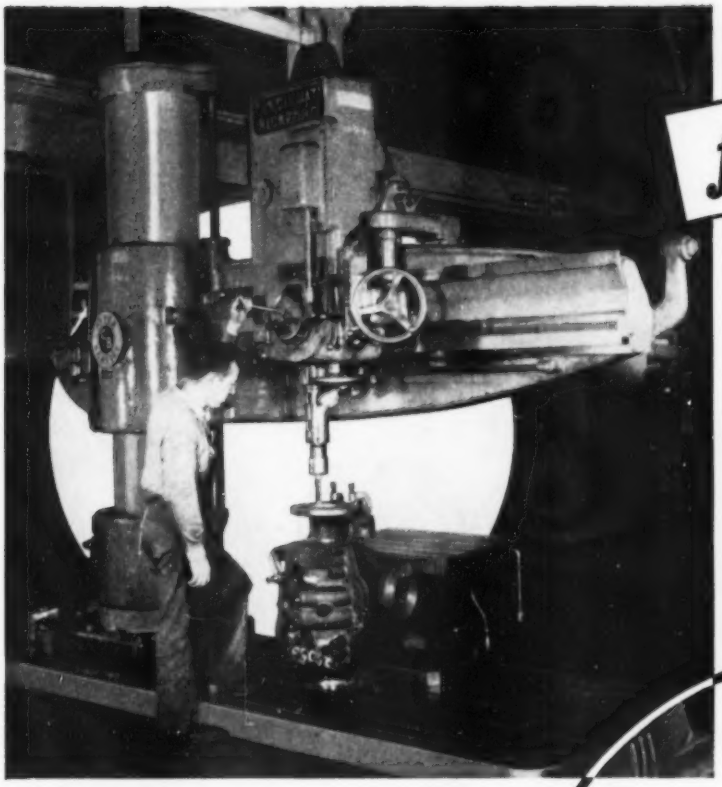
Production management regularly relies upon the engineering services of Jones & Lamson for the latest information on methods, costs, tooling and performance. Why not consult us about YOUR *turning, threading and inspection problems.*

JONES & LAMSON

Machine Tool Craftsmen Since 1835

JONES & LAMSON MACHINE CO., 502 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

FAY LATHE DIVISION

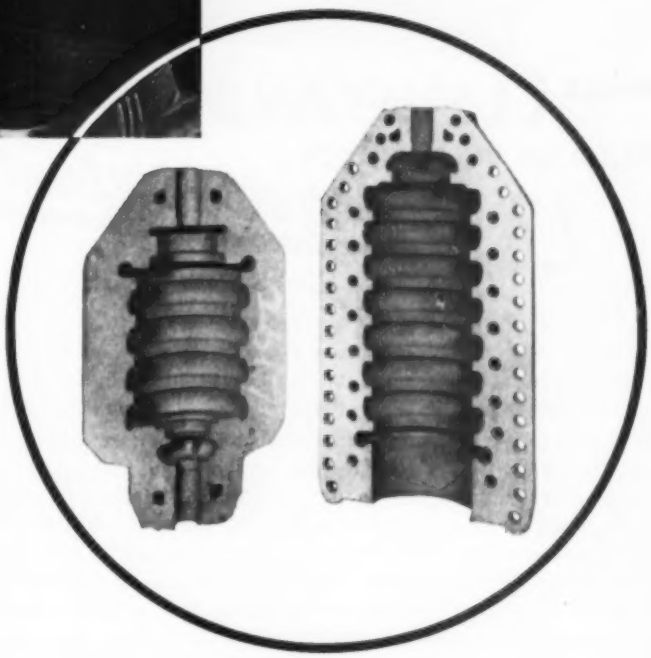


Photo—Courtesy Pacific Pump, Inc.

faster and easier... machine performance

Pacific Pump, Inc., say maximum production is the result of the faster, easier controls and fine balance of our 7′ arm, 19″ column Cincinnati Bickford Super Service Radial Drill. Here centrifugal pumps for process industries, utilities, and marine power plants, are being drilled, tapped, and spotfaced with speed and economy. Cincinnati Bickford Super Service Radial Drills will bring you too, maximum productivity at low cost.

Write for Booklet R-29.



Half shells for a centrifugal pump—approximately 100 holes are drilled—half of which are also tapped.

CINCINNATI BICKFORD

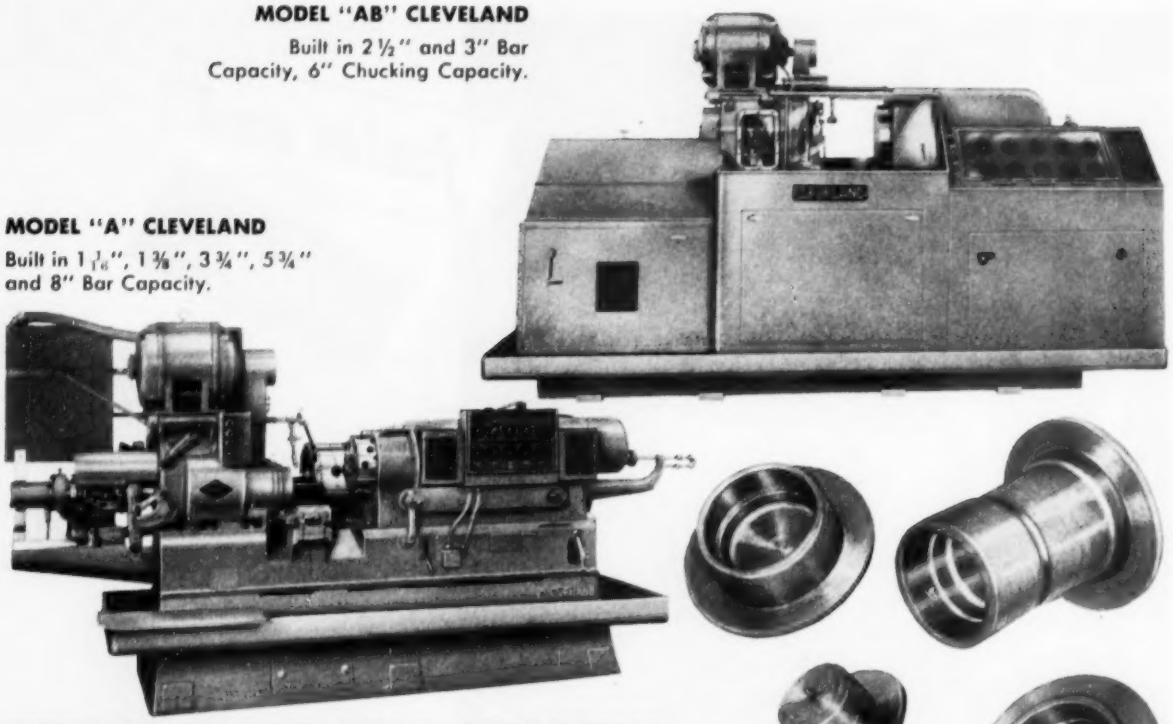
RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

MODEL "AB" CLEVELAND
Built in 2½" and 3" Bar Capacity, 6" Chucking Capacity.

MODEL "A" CLEVELAND
Built in $1\frac{1}{16}$", 1⅜", 3¾", 5¾" and 8" Bar Capacity.



THESE CLEVELAND AUTOMATICS TEAM UP TO PRODUCE *77 jet engine components*

A total of 11 *Clevelands*—Model "A" and Model "AB" Single Spindle Automatics—form the production team selected by one of the nation's leading jet-engine manufacturers to produce 77 separate jet-engine components—a fitting testimonial to the versatility, flexibility and economy of production inherent in these modern *Cleveland* Screw Machines!

Why were *Clevelands* selected? Because they perform a broad range of machining operations without costly, complicated tooling. Because their range of feeds and spindle speeds is ideal for this type of production—parts range in materials from tough steels to aluminum and magnesium machined from bar and extruded stock. Because set-up time is *profitably short*. Model "A" and Model "AB" *Clevelands* are equipped with Electric Feed Drive—a *Cleveland* exclusive. Highly accurate forward and return turret tool feeds are set simply by positioning dials on the control panel. There are no cams to change—no time-wasting set-and-try mechanical adjustments necessary. Producing widely varying quantities of 77 different parts makes quick set-up an absolute necessity.

These features explain why leading manufacturers rely on *Cleveland* Automatics for truly economical parts production. Why not investigate their cost-cutting advantages for *yours*? Call in a *Cleveland* Field Engineer for complete details.

The parts illustrated are among the 77 jet-engine components being turned out on three 3" Model "AB", three 3¾" and five 5¾" Model "A" *Cleveland* Automatics . . . thus solving an involved parts production problem of a famous jet-engine builder with a "one-stop" call at CAMCO!

Remember: *Clevelands Cut Costs*

THE CLEVELAND AUTOMATIC MACHINE COMPANY

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Cincinnati 12, Ohio

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CLEVELAND • DETROIT
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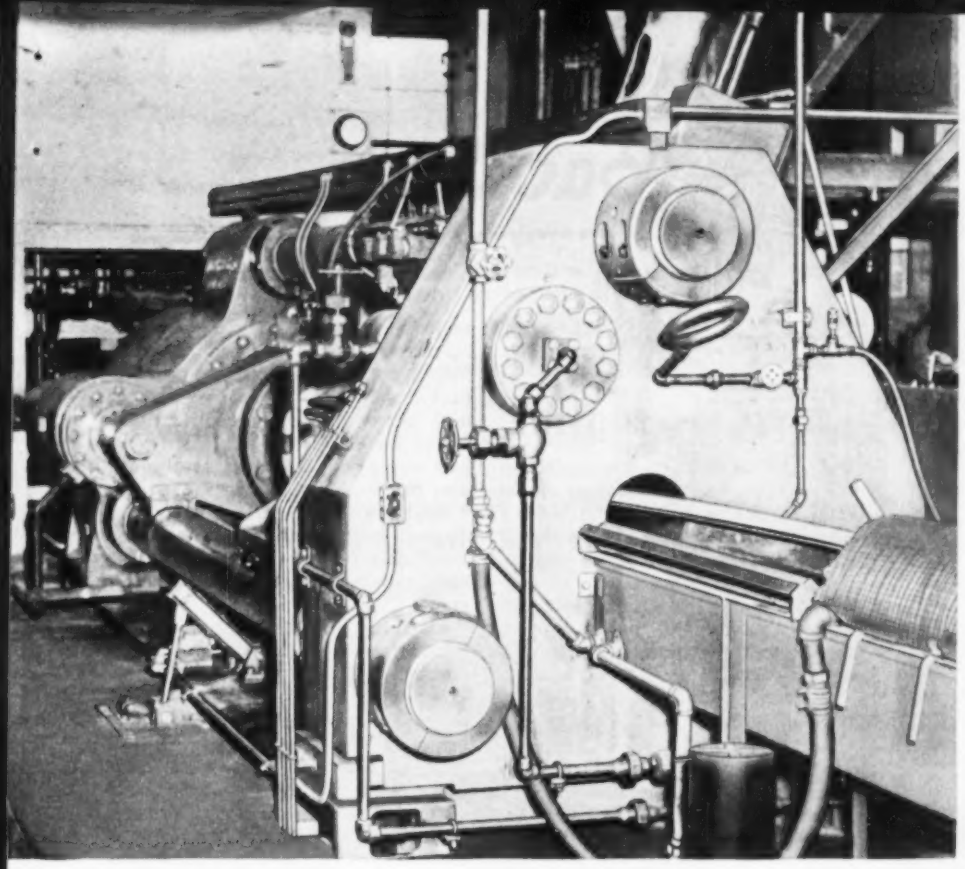
Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines



Puts squeeze on hydraulic press maintenance...

• Shown above is the 1250-ton hydraulic press used by the Light Metals Corporation of Grand Rapids, Michigan, for extruding variously shaped sections of aluminum. When this press was installed recently, officials gave the important hydraulic oil job to STANOIL Industrial Oil. They based that decision on their own experience with this outstanding oil.

That experience covered over four years' use of STANOIL in the hydraulic system of a 315-ton extrusion press. STANOIL has served continuously in this press without being changed or removed for oil maintenance. The hydraulic oil system has never been cleaned and has remained entirely free from deposits and varnish. Hydraulic operation has been efficient at all times.

The experience of the Light Metals Corporation is your assurance of STANOIL's ability to reduce hydraulic system maintenance to a minimum in your plant. This versatile oil will provide clean, dependable lubrication for such a variety of equipment as air compressors, reduction gears, and electric motors. The Standard Oil lubrication specialists will help you make the most effective use of STANOIL. Phone him at your local Standard Oil (Indiana) office. Or write, Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

STANOIL
TRADE MARK
Industrial Oil

What's YOUR problem?

D. R. Clay, of Standard Oil's Grand Rapids, Michigan, office, is the lubrication specialist who has helped Light Metals Corporation keep maintenance of hydraulic units at a minimum through use of STANOIL Industrial Oil.

He is one of many Standard Oil specialists located throughout the Midwest. These men have the practical experience and special training to handle lubrication problems on any type of operation.

Take advantage of the service offered by the lubrication specialist nearest your plant. You can contact him easily by phoning your local Standard Oil Company (Indiana) office. With his help, find how many different oils in your plant can be replaced by STANOIL Industrial Oil on such applications as:

Air compressors . . . no sticking or clogging of valves, less oil consumption in splash or circulating systems.

Speed reducers . . . less wear of gears and bearings during frequent cold starts or prolonged high-temperature operation.

Steam turbines . . . freedom from emulsions and sludge, fewer oil changes necessary.

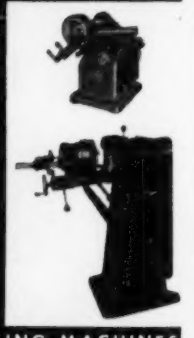
Ring-oiled bearings . . . rings function immediately on starting, less bearing wear.

Circulating and bath systems . . . one oil for a wide variety of jobs.

STANDARD OIL COMPANY STANDARD *(Indiana)*

Keep Your on the OLIVER Line — Cost Cutting Production Boosting MACHINE TOOLS

OLIVER DRILL POINTERS



Properly machine ground drills give better performance. OLIVER Drill Pointers, with each lip doing equal work, give balanced cuts—more accuracy—more perfect holes—more efficiency—longer drill life.

As Illustrated:

No. 21 Oliver Bench Drill Grinder. Hand operated for Drills No. 57 to ½".

No. 510 For Drills ¼ to 3"—2-3-4 flute.

OLIVER DIE MAKING MACHINES

Efficient, speedy and accurate — effecting great savings in time and costs. Skilled labor is not required for sawing, filing, and lapping operations.

Available in 5 Models.

Bench Model S-1 (Illustrated) — Single Speed Die Maker for use on Tool Steel up to 1" Thick.

Heavy Duty Model (Illustrated) — 6 speeds, works in metal up to 3" thick, has variable strokes to 5" with hydraulic feed.

OLIVER ACE UNIVERSAL TOOL & CUTTER GRINDERS

Keep your most difficult cutters sharp with Oliver ACES. They excel on high speed and Tungsten-Carbide work. Direct reading for clearances reduces fatigue — eases operators' jobs.

The ACE excels for grinding face mills up to 15" also, slab mills • slitting saws • all types cutters and reamers.

2 Models: Heavy Duty (Illustrated) and Standard.

OLIVER 20" TEMPLATE TOOL BIT GRINDER

Efficiently powered by a 3 h.p. motor, this OLIVER Machine grinds on the periphery of a 20" wheel. Capacity: tools up to 1½" wide x 13" high; from 0 to 20° clearance. The OLIVER is developed for production sharpening of single point Tungsten-Carbide and high speed tools, offers increased production, lower tool costs and savings in man-hours. Extremely fine finish assured.

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Backlash

EXTRACTS FROM CURRENT LETTERS TO THE EDITORS

Orchids—and Brickbats

Your staff is to be congratulated on the excellence of the job done on the 75th Anniversary Issue. It was a huge project, particularly because it had to be an extra, on top of your bi-weekly regular issues. If you contemplate repeating the editorial content, we should like to know of it, as we could distribute a few to our key field men for their education.

We might take issue with your editors' handling of certain topics, and thought you might like to have our comments, even at this late date.

Hydraulics & Pneumatics (Sec A). Much of this is devoted to JIC standards but you have not included any comment on packings. It seems that packings might have been at least acknowledged as an important part of the hydraulic system.

Lubrication (Sec A). While you have hinted at multi-purpose greases, you have not predicted greases having no melting point and which will not melt away, even under direct blowtorch exposure.

Cutting Fluids (Sec E). This section is well written. However, it omits entirely the development of all-purpose fortified bases miscible with water. On page C-1, you do state that "commercial additives realize a high percentage of the cooling ability of water." However, when you get back to the E section, that point was overlooked.

Heat Treating (Sec G). We have no quarrel with your coverage here. Your only omission seems to have been the heat treatment of aluminum.

Finishing (Sec H). Little was mentioned on metal cleaning, an important process prior to final finishing. There have been developments in phosphate coatings, synthetic detergents and emulsion cleaners.

I trust you will accept these criticisms in the spirit in which they are submitted—as part of a general congratulatory comment on the job as a whole. One question every editor should (and often does) ask when publicity on a new process is submitted is: "Who's using it?" Unless the promoter can supply a proven plant performance record, the idea is still only a glint in someone's eye.

Name Withheld

Your laudatory comments on our over-all job are especially gratifying, but we do wish to make these com-

GRINETICS

BY D G SMITH

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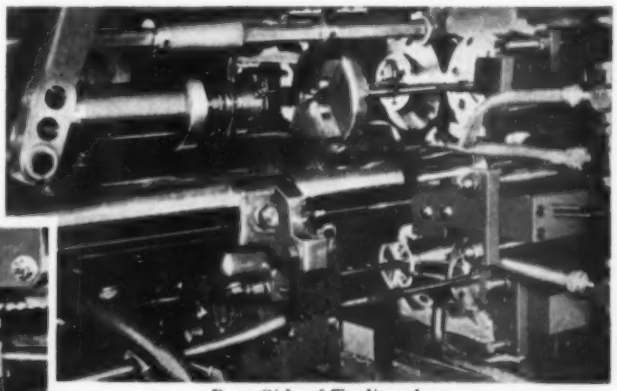
Although certain types of shaft jobs offer natural opportunity as bar machine work, with the exception of the CONOMATIC, seldom do they appear on multiple spindle bar automatics. In general, shaft jobs require a longer tooling area than do other types of bar work.

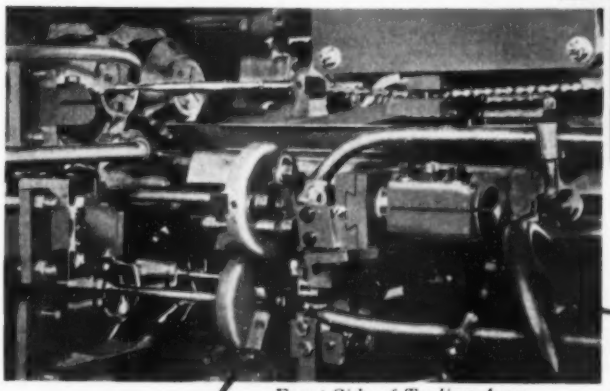
A glance at the frame design of the CONOMATIC explains why its tooling area is longer* than the tooling areas of other "automatics." And there are more tool positions* and more room* for tool setting for *any* type of job.

*You can have the figures

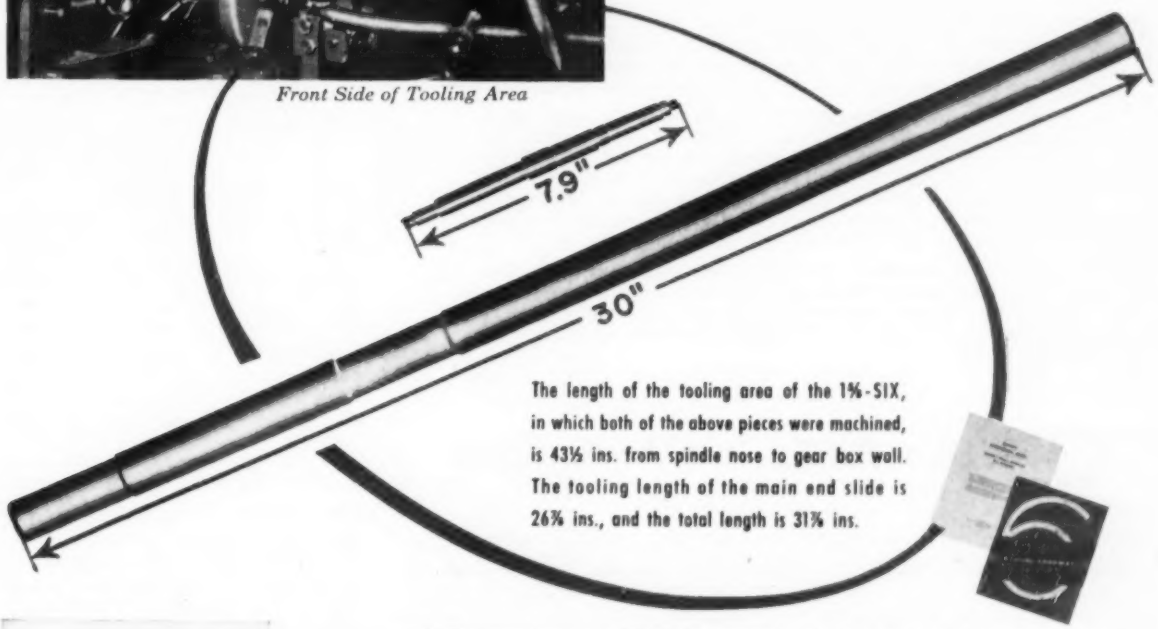
THERE'S *More* THAN JUST *"Elbow Room"*



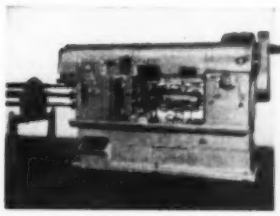
Rear Side of Tooling Area



Front Side of Tooling Area



The length of the tooling area of the 1⅛-SIX, in which both of the above pieces were machined, is 43½ ins. from spindle nose to gear box wall. The tooling length of the main end slide is 26¾ ins., and the total length is 31¾ ins.



A Comparison of ALL Automatics is in favor of Cone

Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.

Westinghouse has everything for arc-welding anything... ...anywhere

We can solve all your arc welding problems! Whether the application is one of joining different metals, similar metals, thin metals or heavy plate, Westinghouse can help you find the answer!

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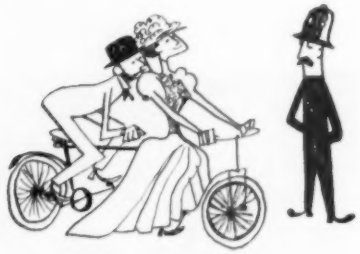
ments. In attempting to look ahead for a decade, we naturally cannot confine ourselves to discussion of processes with a proven performance record. What we tried to do was to predict to the best of our ability the "glint in someone's eye" which will develop into something more than that, and the glints that will fade out into nothing at all.

Our big issue represents intensive editorial work over many months. We tried to evaluate one development against another and then come up with what we believed to be the right answer. We have no illusions about the fact that we cannot always be right, despite our valiant efforts to achieve perfection.—Ed.



Alas for Chivalry

As one who frequently rode a tandem back in the Gay Nineties, may I point out an error in the illustration on page 7 of your 75th Anniversary Issue? This shows the lady riding on the rear seat, but she always rode in front. Otherwise, the man would kick her as he got on or off.

Fred Colvin
New York City

In our younger days we, too, always went by the principle of "Ladies First," but it seems the younger generation doesn't bother about such things. Still, we doubt if even our present crop would go so far, intentionally, as to place a lady in a position where she would get her teeth kicked in. Let us attribute the error, then, to artistic license.—Ed.

Helping Hand

Your article on employing physically handicapped workers (*AM*—Dec 22 '52, p102) was a fine piece of work, and now that you have shown how a big company like Westinghouse can do it, I hope other companies will profit from the lesson. There is just one fly in the ointment, however. You stress that Westinghouse has an elaborate personnel setup for checking exactly where every handicapped person can be fitted into the picture. This would seem to

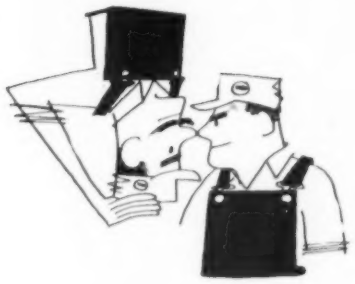
rule out the possibility of smaller outfits employing such people.

Actually, this is not the case, and small plants can hire handicapped people with equally good results. If they just use a bit of common sense and realize the worker's limitations, they can find lots of jobs where he can perform just as well as another man. It is an established fact that a handicapped worker is nearly always a better worker, because he has less tendency to stray to other jobs, is proud of his ability to keep pace with other workers, and usually has a feeling of gratitude.

The chief difficulty is in preventing other workers from sympathizing and offering an unwanted helping hand, but this can be overcome in a very short time if the handicapped worker himself lets it be seen that he is capable of handling job.

Westinghouse has rendered a real service to humanity by hiring such workers, and you deserve equal praise for publishing the story.

Robt Earnshaw
San Francisco

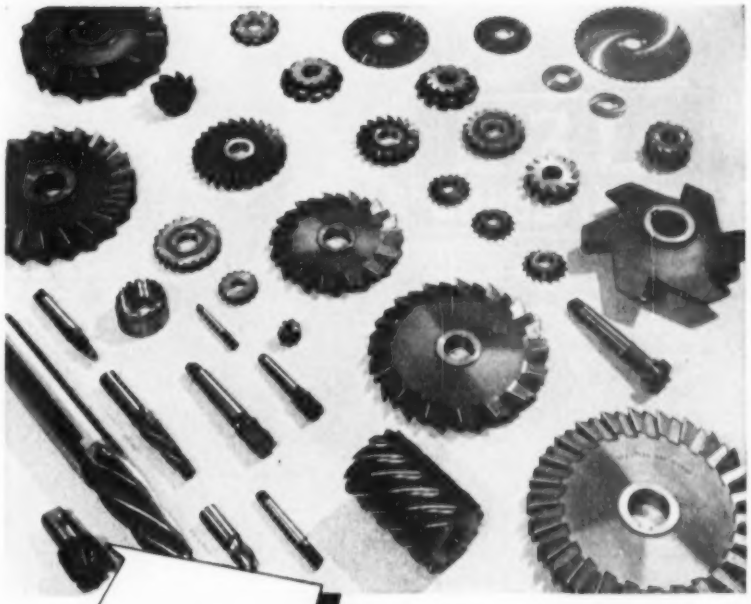


Back to Front

The other day, I saw a new man in our shop running a turret lathe with the tool in the back toolpost turned upside down. I asked him about it and he said that it was the usual practice in his country. Of course, I have seen cutting-off tools in the back toolpost when the front post was used for some other tool, but I have never seen it used for straight turning. This man, a Frenchman, claims that you can do better turning that way. Is he right?

P. J. Rawlings
Cranston, R. I.

We have seen this practice in French plants but are not prepared to say whether there is any advantage from the standpoint of finish or accuracy. There is one advantage—the chips curl downward at the back. On the other hand, it is difficult to remember to withdraw the tool from the work by turning the handwheel to the right.—Ed.



THE *Complete Line*

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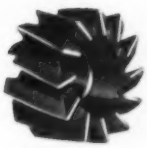
END MILLS AND MILLING CUTTERS



For profitable solutions to production milling problems, call on Gorham! Over thirty years' experience in creating fine cutting tools is your assurance of satisfaction.

An extensive line of *standard* end mills and milling cutters is stocked by Gorham distributors. When you need *special* tooling, a Gorham Field Engineer surveys your problem and makes design recommendations for a tool to be "tailor-made" for your application by skilled Gorham craftsmen.

Ask your distributor for Gorham "standards." For "specials," call in your nearby Gorham Field Engineer. They're both well qualified to help you . . . and backed by unmatched experience and facilities. For profitable solutions to milling problems, call on Gorham! There's no obligation.

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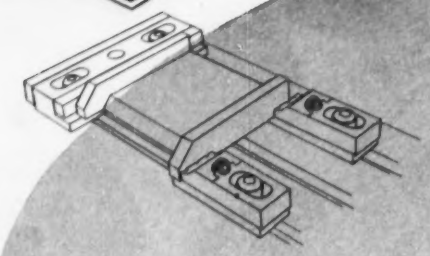
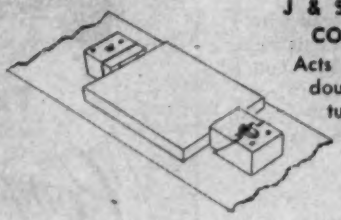


J & S DOUBLE ½ VISE
WITH MATCHING PARALLELS

- for unquestionable repeated accuracy
- for quicker set-ups
- for stronger grip
- for less obstruction

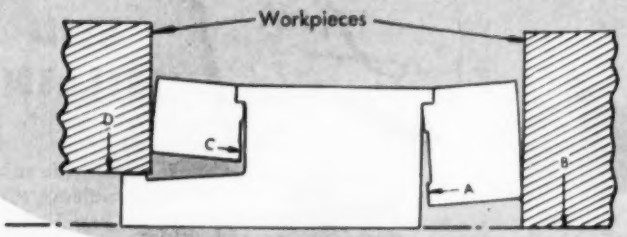
DOUBLE ½ VISE IN USE WITH ALL-PURPOSE JAW CLAMPS

for use on jig borers, millers, planers and shapers.



J & S DOWN-HOLDING COUNTER CLAMPS

Acts on same principle as double ½ vise (left). Fixture clamps operate on the same principle as the all purpose jaw clamps.



Approximately 3 tons pressure closes Gap A, and approximately ½-ton closes Gap C—producing a down-holding action on each respective piece of approximately the same force.

Hinged, Spring-Loaded Jaw Gives Positive Down-Holding Action

Hinged lip in-and-down action combined with in-and-down action of clamp holds workpiece against table and absolutely parallel. **Construction is of oil-hardened tool steel, ground and blackened.**

Jig Borers—quickly set up for jig-boring accuracy.

Millers—eliminates heavy miller vise and allows milling of more pieces.

Planers—eliminates strap and finger setups.

Shapers—eliminates vises.

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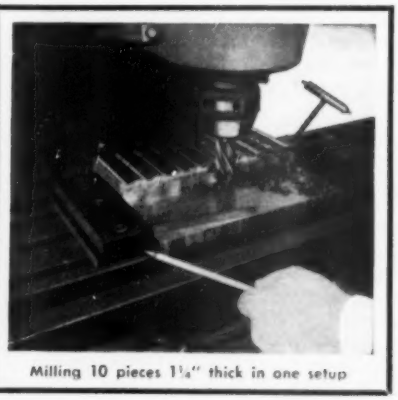


Milling 10 pieces 1¼" thick in one setup

model "REC" with detachable micrometer base

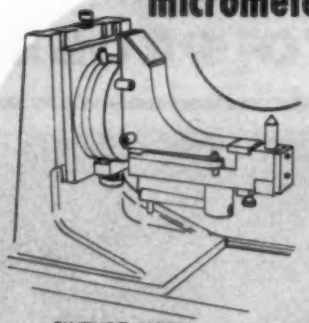
.0001" ACCURACY

Fluidmotion

WHEEL DRESSERS

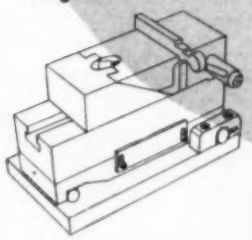
dress two angles tangent to a radius in one continuous motion

High-Carbon, High-Chrome Construction

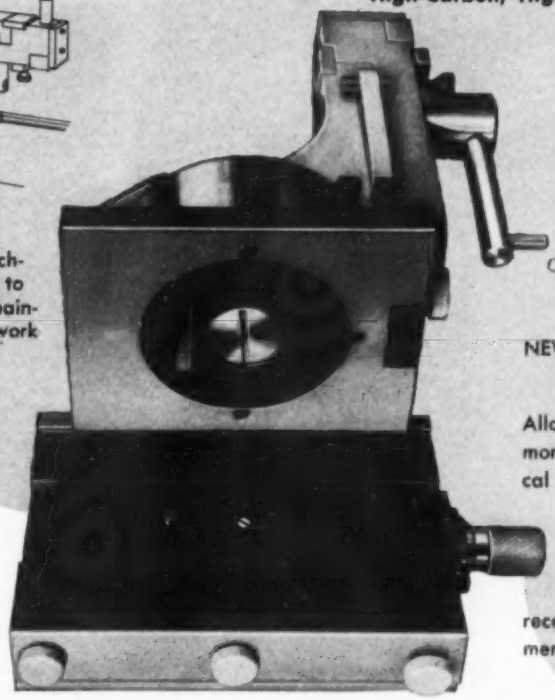


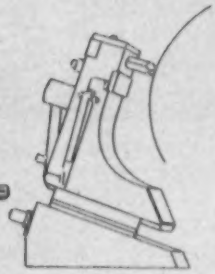
FIXTURE WITH MICROMETER FEED

Under the wheel attachment makes it possible to dress under the wheel, maintaining any desired work height.



Precision Grinding Vise with or without sine bar allows rapid unloading and exact relocating.





NEW SOLID ANGLE RAMP WITH MICROMETER LEAD SCREW

Allows fixed position of diamond when used in cylindrical grinding for dressing above the center line, but coincidental with the center line of the wheel. Factory will recommend proper equipment on request.

Adaptable to All Types of Cylindrical and Surface Grinders

By loosening gib, dresser can be removed from the micrometer "C" Base and affixed to solid or adjustable angle ramp for cylindrical grinding. For surface grinding the dresser is returned to "C" Base.

Photograph on right shows special compound base with micrometer lead screw having travel in four directions. Dresser usually is furnished with extra stops for zero setting.

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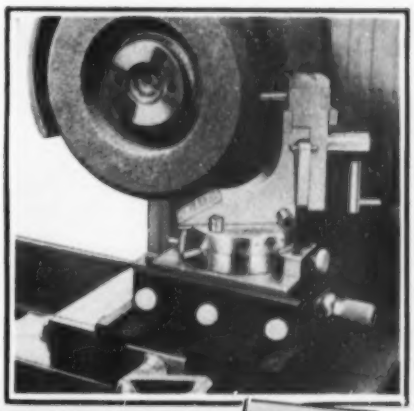

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A variety of models and attachments to suit your needs. Write for free catalog covering dressers in detail. J & S also manufactures a complete line of All-Purpose Jaw (machine) Clamps, Vises, and Special Tools. Write for Machine Shop "Time Savers" booklet.

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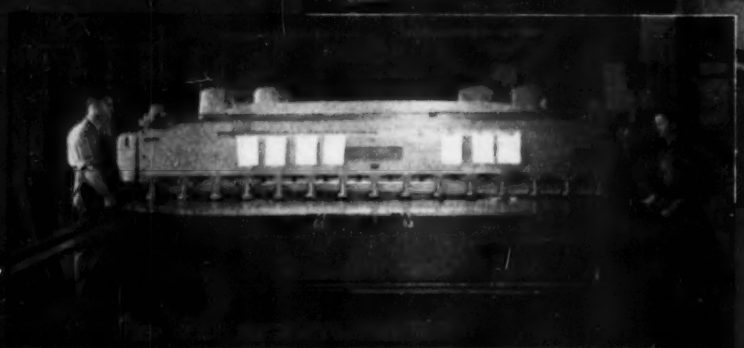
Hospital Sterilizer

Hospital Utility Cabinet

Special Stove

Three Cincinnati All-Steel Shears at Jamestown Metal Products Inc.



1814 Cincinnati All-Steel Shear with hydraulic holddowns, squaring arm and front controlled power back gauge.

is necessary...

THESE TOP QUALITY PRODUCTS

ACCURATE SHEARING

Jamestown Metal Products Inc. produces quality stainless steel equipment for hospital and home. Exact manufacturing standards are maintained.

Cincinnati Shears cut blanks accurately and to size for this equipment. Gauging must be rapid as well as accurate to handle the many different sizes required and keep production costs low.

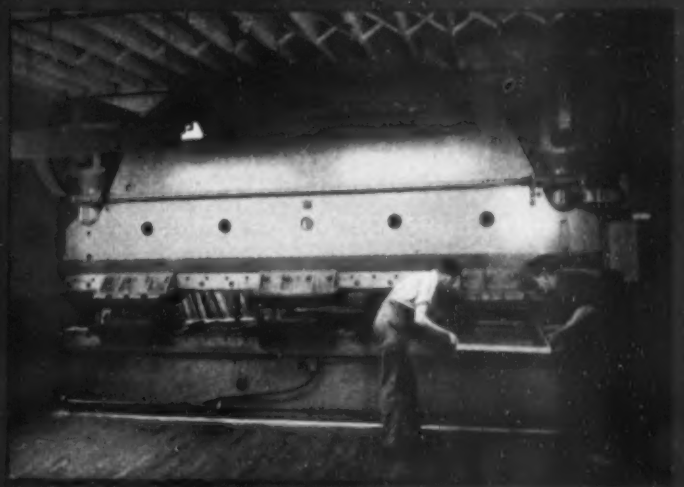
ACCURATE FORMING

Cincinnati Press Brakes form these blanks into accurate parts that fit correctly and insure outstanding quality in the finished products as well as maintaining low assembly costs.

You, too, can expect true blanks and accurately formed parts from this profitable team of Cincinnati Shears and Cincinnati Press Brakes.

Write for Catalogs S-6 and B-3, illustrating and describing these machines.

A row of Cincinnati All-Steel Press Brakes used in the production of these quality products



A 130 x 14' Cincinnati All-Steel Press Brake 14' 6" between housings tooled for multiple operations

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CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

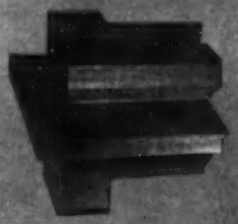
CINCINNATI

Outstanding ACCURACY is necessary...

TO PRODUCE THESE *top quality products*

Slots, angles and compound angles are shaped to 0.001" limits on these solid 3140 forged steel tool holders.

Special index heads have slots accurate in shape, size, spacing and angularity to 0.001" on all dimensions.



Vee block fixtures of solid 6145 steel are completely shaped to very close limits.

Cincinnati Shapers do these jobs

The Jordan Specialty Company . . . Shaping Specialists . . . use Cincinnati Shapers exclusively. Outstanding accuracy and versatility in production are obtained in connection with low machine investment and low tooling costs. Due to the great variety of work produced, changes from part to part must be done with minimum loss of time. Here, Cincinnati Shapers give an exceedingly profitable and outstandingly accurate performance.

Write for Shaper Catalog No. N-5 covering the complete Cincinnati line.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

SPOT NEWS of Metalworking

- **Expenditure of an estimated $1-2 billion for metal-cutting and metal-forming machines** will be made by Pentagon over next few years to set up standby defense production facilities, if recommendations of Vance Committee are followed. For detailed stories on other Vance Committee recommendations, turn to pages 119 and 290.

- **Canadian defense spending will hold up through '55,** says Production Minister C D Howe in extending the arms budget through 1954-55. Program originally called for a 3-year, $3 billion outlay ending in 1953.

- **New budget's $9-billion request for planes** brings total of aircraft asked for in budgets since 1950 to 51,500. Of this the Air Force gets 23,000, the Navy 11,300 and the Army 4000. Foreign aid calls for another 8000, exclusive of off-shore procurement. New budget ups total to date by about 5500 planes.

Prospects look good for materials handling industry, says George Spatta, president, Clark Equipment Co. His reasons: need for advanced handling equipment to pace modern technology, mechanized handling cuts finished product costs and makes maximum use of floor space to offset rising building costs.

- **New group health plan is to be pushed by International Association of Machinists,** which is hiring a new health director to tour plants and "see whether the health of members is being endangered."

- **New ship construction totalling $118.5 million is in the Truman budget.** If passed, it will finance building four passenger-cargo ships for the Maritime Administration. The ships are reported to be prototypes of a war-adaptable tanker fleet.

- **Hand-spot-welder, shaped like a submachine gun,** that literally shoots spot-welds into metal at a cost of one cent per 500, will be previewed at the forthcoming British Industries Fair, Birmingham, April 27-May 8.

Air Force nomenclature guide is now available to contractors and manufacturers to assist in preparation of drawings and specifications. Guide contains official names for all aircraft components and is available from Hq Air Materiel Command, Wright-Patterson AFB, O.

- **Scrap is now so plentiful salesmen can't get a foot in the door** at many Cleveland and Mahoning Valley steel plants. Scrap prices are still steady, however, and demand remains high for good scrap steel rails.

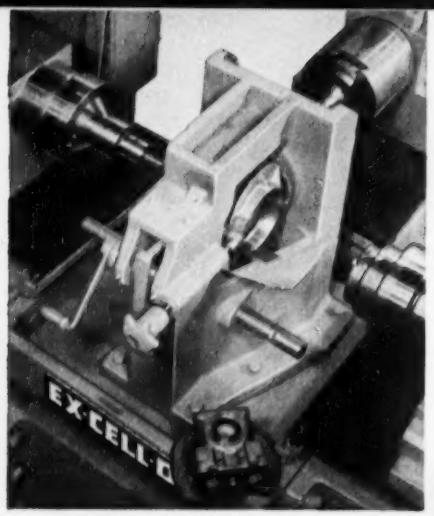
- **Machine produces perfect lead-steel chemical bond.** Knapp Mills' automatic bonder in one day will clad a steel surface requiring 8-10 man days to cover by hand techniques. Unit will chemically bond lead strip up to 12" wide by ¼" thick to prepared steel so that it will not separate unless melted off.

- **Highest strength standard aluminum sheet and plate alloy,** Kaiser Aluminum & Chemical's No. 75S, has a cladding thinner than normal thickness for regular Clad 75S and is designed to meet aircraft manufacturers' requirements for better physical properties without sacrificing cladding protection.

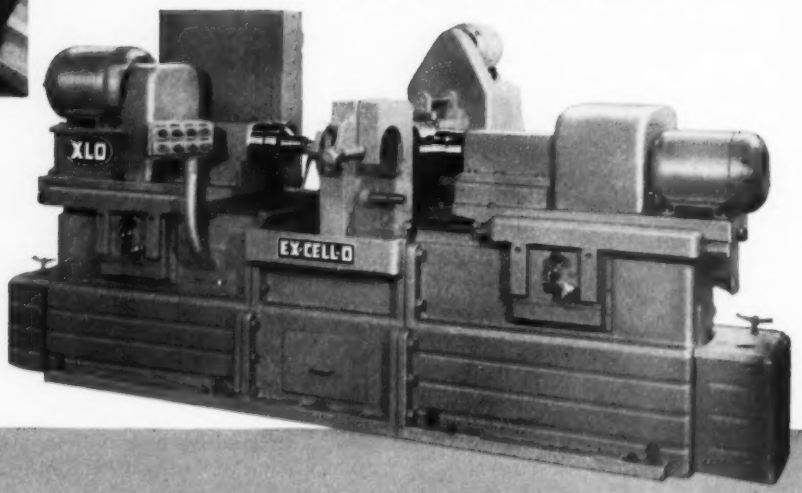
- **Cadillac has stepped up engine output 20 hp on its new models** by reducing heat losses and increasing "breathing capacity" and compression ratio to 8.25 to 1. Engineers claim engine has potential compression ratio of 12 to 1.

Combine Operations

FOR PRECISION



Close-up view shows relatively simple tooling.



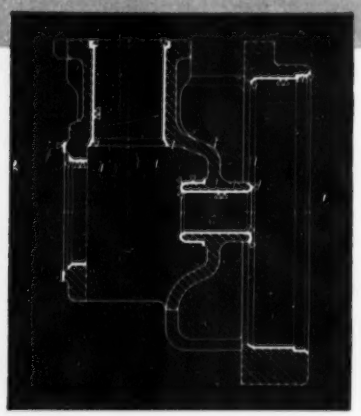
Ex-Cell-O Three-Way Precision Boring Machine.

COMBINING OPERATIONS CUTS COSTS, BOOSTS OUTPUT, PROMOTES ACCURACY

Once a part is properly located and clamped it's good practice to do as much machining on it as possible before it's moved. In this way the various operations can be held in accurate relationship to one another, production is increased, and handling time is minimized.

In machining this cast-iron refrigeration crankcase, five roughing and eighteen finishing operations are held in accurate relationship to one another, with extremely close tolerances on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines, or write today for Bulletin 31631.



Sectional view with heavy lines to show operations. Single and double triangles indicate, respectively, single operation and rough-and-finish operations.

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52-13

Washington

The changeover at the Defense Department will be smoothed. Many of the assistant secretaries will stay on until the Senate approves the Eisenhower cabinet appointments. At least one key Pentagon man will stay right at the top under the new administration.

He's assistant secretary for budget Wilfred J McNeil, who'll be acting Defense Secretary until the Senate confirms the Wilson appointment. McNeil is a Republican and author of several money-saving plans. A friend of Eisenhower, he got both Lovett's and Wilson's recommendations to continue. He has held the top budget job under every Defense Secretary since Forrestal.

Chances are also that the top procurement secretaries will stay on the job for some months while the new service secretaries break in. The Vance Committee's philosophy—that it's cheaper and better security to build up and maintain reserve production equipment than to stockpile military end items—is really the key of our all mobilization program. (See page 290)

Now, there's an attempt to apply this idea clear across the economy. In his swan-song report before leaving as Chief Defense Mobilizer, Henry Fowler said that by March his agency will have the results of a survey aimed at this critical problem. Basis for Fowler's plan is a survey to measure the nation's maximum production potential in an all-out war. This is how the study works:

Strategic war plans of the Joint Chiefs of Staff are being translated into specific end-products, components, and materials. The same is being done on defense-supporting industries and on requirements of a bare-bone, austere civilian economy.

Total requirements will be subtracted from a compilation of US facilities to produce these goods in a given period of time. Specific deficiencies that show up would be the much-publicized "gap in the mobilization base."

Thus, the report should show just how much hard goods could be produced in this country during the first year after outbreak of all-out war, during the second year, etc.

This is a brand new approach to mobilization planning. Previously we started off with requirements. Now we'll start off with available resources, then try to remedy the deficiencies.

• • •

Mobilization planners are worried about how to sell their program to Congress and the public. Its adoption would put a damper on the hopes of all those looking for quick tax cuts, reductions in the military budget, and reduced expenditures on foreign aid.

Such a program for full mobilization would require new legislation authorizing the government to: (1) build plants to make essential goods that private industry might be unwilling to produce, (2) maintain reserve production capacity in a ready standby condition to avoid costly restoration expenses when needed.

• • •

Don't count on a tax cut this year. Congressmen and Senators are under pressure to let the excess profits tax die June 30—and let the post-Korea personal income tax increase of about 10-11% expire at the end of 1953 as scheduled.

But Ike is saying that we should balance the budget first—and then think about cutting taxes. It would take all the money raised by present tax rates to balance the budget, even if the Republicans make good on their talk of cutting federal spending back to $70-billion.

One alternative being talked up is this:
Let the excess profits tax expire on June 30—but increase the corporate income tax rates enough to offset the loss in revenue to the government. That would be a hard pill for Congress to swallow, since the top corporate rate is already 52%.

Ike's final decision on taxes should come soon. He feels he should give Congress the word on his views as soon as possible.

• • •

Ike's Budget Director—Joseph Dodge—got on the record as to the chances of budget cuts even before Truman's budget got to Congress. (See page 296)

There's little chance to cut down government spending during the year beginning June 30, Dodge told a special press conference, because the really big dollar outlays can't be turned off like a faucet.

Dodge talked about another stretchout as one way of holding down government spending. But he recognized that spreading out contracts for planes and other items over a longer period of time means increased unit costs. He didn't propose that this be done—he only discussed this as one of the possibilities that could be considered.

• • •

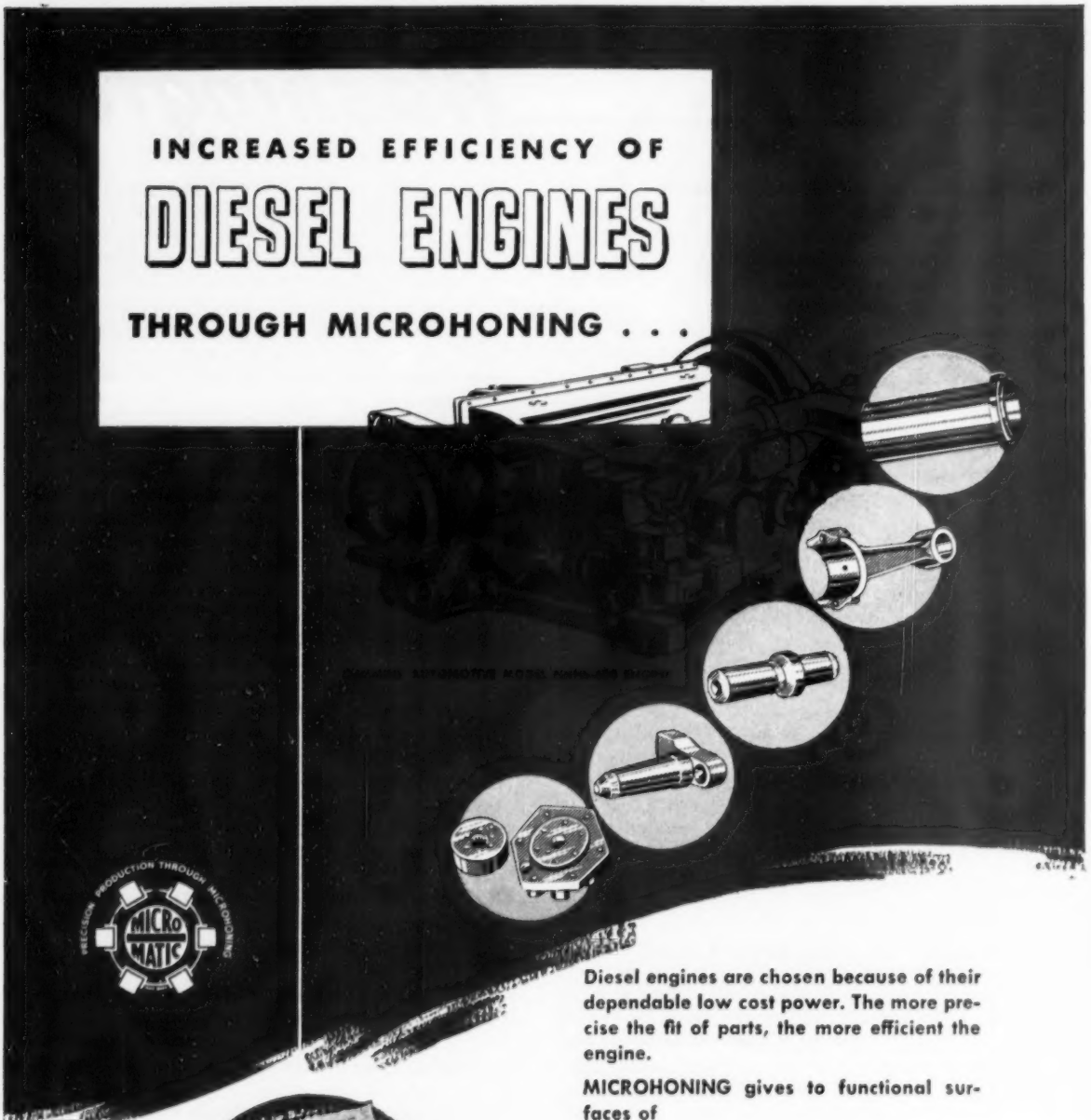
Taft-Hartley hearings will begin next month, but don't look for any amendments until summer. Both Senate and House committees plan lengthy hearings. Almost everybody who asks will be heard.

Sen. Taft still will have most to say about how the law will be revised. Although no longer chairman, he remains on the Labor Committee and will be in charge of amendments on the Senate floor as majority leader.

INCREASED EFFICIENCY OF

DIESEL ENGINES

THROUGH MICROHONING . . .



PRECISION PRODUCTION THROUGH MICROHONING

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Diesel engines are chosen because of their dependable low cost power. The more precise the fit of parts, the more efficient the engine.

MICROHONING gives to functional surfaces of

- cylinder liners
- connecting rods
- valve guides
- injector barrels
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accurate size, true geometry, and the characterized finish—all at production rates.

For information on MICROHONING of DIESEL ENGINE PARTS

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Detroit

Pessimists in Detroit had a hard time standing their ground after autodom's top executives got out their views of the coming year.

Without exception, car-company leaders cheerfully predicted a rosy business year. Also, without exception, each inserted an "if" clause into his forecast: If defense demands are not jacked up unexpectedly, 1953 production will exceed in good measure 1952's output, which ran slightly over 4.3 million units.

The top brass hopefully suggested that perhaps materials controls will be junked, and reasoned that if such is the case, 1953 will be the first post-World War II year wherein full production and free competition will exist together.

In some statements—as in that of General Motors President Harlow H Curtice — there were gentle rebuttals to the opinions of many economists who foresee a minor recession in the coming months. Said Curtice: "We (in the automotive industry) believe that 1953 will be a good business year all year."

• • •

A year-end survey of a group of automotive writers produced composite estimates of 1953 car and truck production which generally reflect opinions of auto-company executives. The average estimates of the writers: 5,238,000 passenger cars and 1,371,000 trucks and buses. If achieved, such production would make 1953 the second-largest year in the industry's history.

Automobile sales in Wayne County (and Detroit is considered a bellwether in that respect), were higher in November 1952 than November 1951. This same situation held true for October.

Significance: Before October it had been 20 months since any single month eclipsed the record of the comparative period a year earlier.

• • •

For three or four years now, Ford Motor Co has been talking about beating Chevrolet, getting back its place in the sun, etc. It looks as though that long round of needling may at last be getting under GM's skin.

At a recent press preview, Chevrolet sales manager W E Fish had some tart remarks about his firm's standing, noted here earlier. Then, at GM's preview, wherein were announced 19 models with automatic transmissions, one official spoke thusly: "One of our competitors (Ford) had a press conference and announced a delivery model with automatic transmission. That press-conference transmission isn't in production yet. They beat us on the press conference, but not on production and availability to customers."

• • •

GMC, incidentally, furnished a kind of signal as to the outside limits on one type of commercial-vehicle horsepower. One experimental 300-hp diesel powerplant was put on test with Pacific Intermountain Express for more than 100,000 miles. It made the Denver-Coast run three hours quicker than trucks now on the road (more lugging power up hills), but still proved out to cost thin fractions of cents more per mile. Reason: too much horsepower created too much initial and running expense. Another try will likely be made 225 hp.

Truck manufacturers in general, it might be noted here, have two primary long-term aims in their minds. Much research and development work is concentrated along these avenues: (1) A reduction in vehicle weight; and (2) an increase in load-carrying space.

• • •

Personnel note of interest to manufacturing people generally: Logan C Miller, who started in an Illinois Central railroad machine shop 49 years ago, retired from Ford Motor Co in January as a manufacturing vice president. He has become a consultant for Bower Roller Bearing Co, Detroit.

• • •

Most intriguing new mechanical development in the diesel business is a General Motors valveless design introduced by Detroit Diesel Engine Division in a lightweight 86-hp series, for marine application. Loop scavenging is actuated by a blower which forces air into a series of apertures around the cylinder liner near the bottom of the piston travel, expelling exhausted air through larger apertures around about 1/3 of the diameter. Efficiency is said to be at least as good as on valved models.

This series has been considerably tested in Chevrolet trucks in South America. Early truck adaptations are not foreseen—the engine is a little expensive for its weight class. However, truck applications are far from improbable over the longer term.

• • •

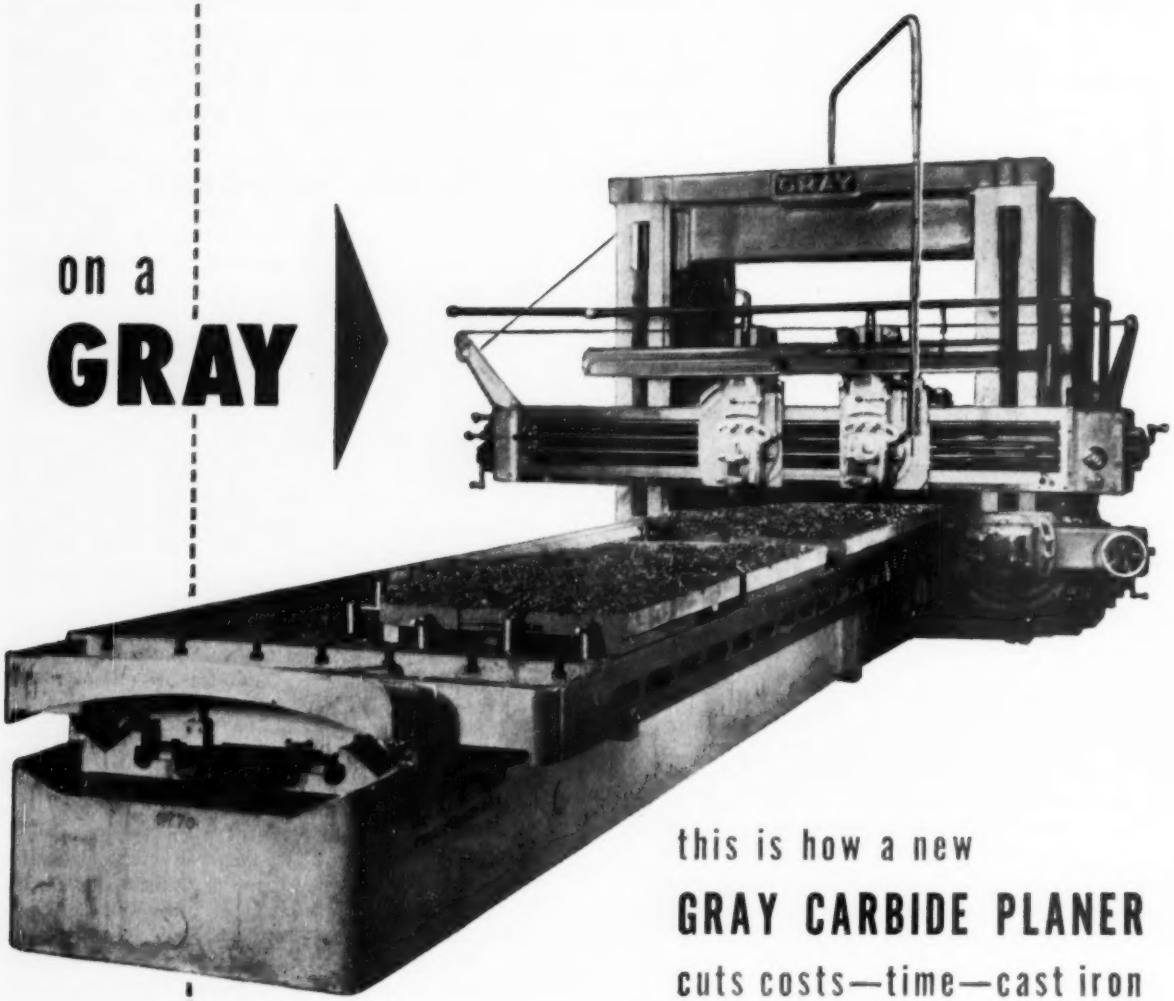
Ford will step up capacity of its automatic-transmission division by late next year or early 1954. The company now has options on 100 acres in Sycamore Township, Ohio, near Cincinnati. Construction of a manufacturing plant with 350,000 sq ft will begin in the spring.

• • •

Until upcoming changes by Chrysler, Cadillac will be the most powerful 1953 model coming off Detroit assembly lines. The Cadillac power plant develops no less than 210 hp, slightly over the 1953 Lincoln rating, and well above all others. Chrysler, now producing a 180-hp engine, will introduce a modified version which will compete with Cadillac.

BIG CARBIDE PLANING PROFITS

on a
GRAY



The F. X. Hooper Co., of Glen Arm, Md. is successfully and profitably carbide planing cast iron frames on this new 84" x 60" x 18' high speed GRAY PLANER.

this is how a new
GRAY CARBIDE PLANER
cuts costs—time—cast iron

- using modern carbide tools at speeds up to 300' per min. — feeds up to ⅛" and depths of cut to 1¼".
- Check your planer department's time and cost figures. New GRAY performance will make your old planer *really old.*

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Machine Tools

The machine tool industry will do a business of about $800 million annually for several years if the program of the Vance Committee, announced last week, is carried out.

Here is the way in which the committee breaks down this over-all figure:

Normal commercial demand will supply $300 million of orders, or perhaps considerably more.

Around $300 million will be spent by the government to keep its present inventory of machine tools in up-to-date condition.

Some $200-$500 million will be ordered by Pentagon to attain the mobilization production capacity which the committee advocates (for detailed story on the Vance report, see page 290).

• • •

After the desired mobilization production capacity is reached, the machine tool industry, the report estimates, still will have an annual business of $600 million.

This volume would be divided equally between normal commercial orders and government orders for maintaining a modern national reserve of machine tools.

• • •

Present and projected inventory of government-owned machine tools is put at 550,000 units. Replacement cost of these machines is estimated to be more than $6 billion.

About 5 percent of this valuation must be spent each year, or $300 million, the Vance Committee says, to maintain this inventory in reasonably modern condition.

In arriving at this percentage, the committee took into account "the present rate of technological progress, the changing patterns of end-item production, obsolescence and depreciation."

• • •

Vance Committee guesses that the privately-owned inventory is 2-2½ million units, including metal-forming as well as metal-cutting machines. Replacement value: $15-$25 billion.

American Machinist's Mid-Century Inventory of Metalworking Equipment, sole authoritative source of such information, shows 1,762,165 metal-cutting machines and 471,257 metal-forming machines installed in private industry. That is a total of 2,233,422 units.

• • •

In modernizing constantly its production equipment, the government must avoid forced liquidation of machine tools in competition with normal production of the machine tool industry, the Vance Committee declares.

The committee says that "government actions along those lines have had disastrous effects on this industry in the past."

Management of this (government) inventory has a tremendous bearing on the financial condition of the production equipment industry and could affect the industry even to the point of jeopardizing its existence, the committee concludes.

• • •

"A healthy machine tool industry is a key factor in the nation's ability to adopt and apply the policy of establishing and maintaining production capacity necessary for an adequate mobilization base," the committee bluntly declares.

Special consideration should be given the machine tool industry, at the start of any future emergency, in application of wage and price controls "to encourage rather than impair rapid expansion of production," the report states. It cites delays of many months in the current emergency caused by "arbitrary and unrealistic price and wage controls."

• • •

An important objective of government policy, the committee feels, should be the maintenance of modernized industrial plants and facilities in general.

"Efficiency of production has a vital bearing on the amount of the productive capacity normally devoted to satisfying civilian needs which can be converted to production of weapons of war."

Size and health of the machine tool industry depends to a considerable extent on the demand resulting from the replacement and modernization of the production equipment of civilian industry.

This modernization, in turn, has a bearing on the convertibility and expandability of the machine tool industry to meet mobilization needs, the committee asserts.

• • •

Elimination of some types of machine tools from the so-called "critical list" is near at hand. These machines have been reserved exclusively for rated customers up to now.

NPA's Metalworking Equipment Division has been examining order boards lately to see to what extent the situation in critical tools has eased. The anticipated paring down of the list is the result of this survey.

• • •

Many machine tool builders report a sizable inflow of civilian non-rated orders. While the automotive industry has contributed an important chunk of this business, the volume is widely distributed among user industries.

Much scattered buying is being done involving either single machines or 2-3 machines at a time. Inquiries are reported to be heavy.

BF

SHOP TIPS

New, Free Magnet Idea Kit for Shops

A handy new literature kit showing the hows and whys of permanent magnets is currently sparking shop men to real savings in time, money, effort.

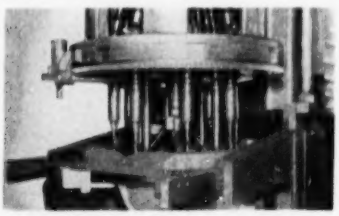
To date, the magnets have proved very effective as sheet steel separators, magnetic stands, tool-holding devices, sweepers' "pickup" tools, paper grippers and tool retrievers, to name a few uses.

Magnet Idea Kit can be obtained free from Carboloy Department of General Electric Co. (See address at right.)

★ ★ ★

Drill Cast Iron with Carbide Twist Drills

Drilling cast iron with carbide twist drills is definitely past the "maybe" stage. Users report doubled production, more than tripled drill life over



H.S.S. drills, without any special drilling equipment or job engineering. Sound, how-to-do-it technical bulletins available free. Write Carboloy Department of General Electric Co. (See address at right.)

★ ★ ★

New Masonry Drills Won't Stall, Pack

An outstanding advance in rotary drilling of masonry was recently unveiled in Carboloy oval-flute "Live-Spiral" Drills.

The drills, tipped with Carboloy cemented carbide, won't stall or pack even at very rapid speeds. They work equally well in concrete, brick, plaster, slate or asphalt. For full details write Carboloy Department of General Electric Company. (See address at right.)

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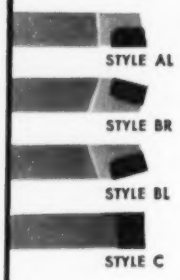
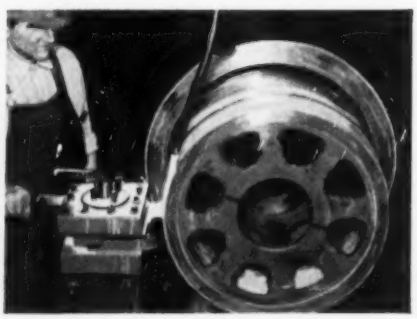
We can help you get swift tool-

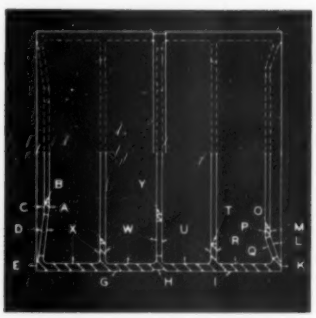
Here's how one leading manufacturer quickly adapts low-cost Standard Carboloy Tools to his single-point tool machining operations – jobs that would normally require costly "specials" – and gets them on the jobs *in minutes*. No special grinding equipment. No delays or heavy inventories. By standardizing on "Standards," he gets full carbide benefits shop-wide – just as you can. Check these pages. Then send me blueprints of your tough single-point tool jobs. We'll show you how easily "Standards" can be best for you, too.



1 Gets 14 "specials" from these 4 styles of "Standards" – A large Midwestern manufacturer (name on request) needed 14 specially shaped tools for a rush job on cast steel gear blanks. From their stocks they selected the 4 Standard Carboloy Tool styles shown . . . ground them to the shapes needed in minutes per tool. No long waits for costly "specials," no extra expense or production delays. (See illustrations, below and on right-hand page.)

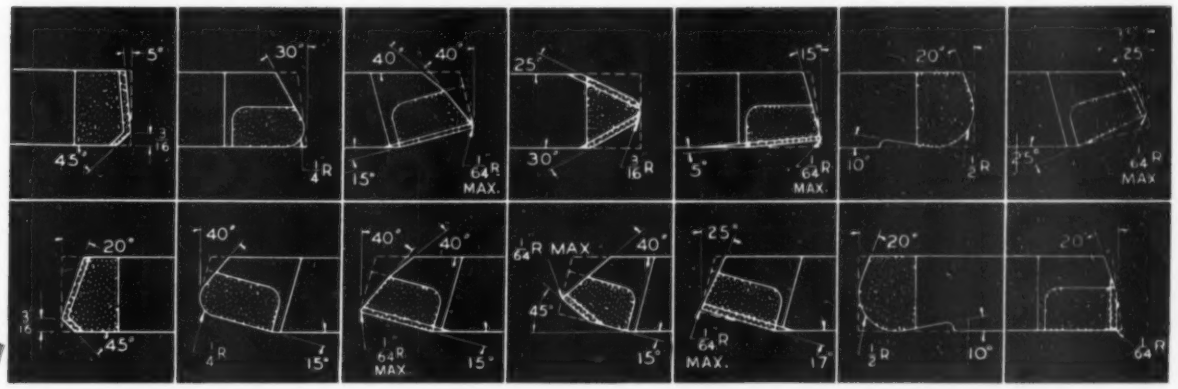


Here is the job – a tough steel casting 26" in dia., 28" wide, and requiring a wide variety of rough and finish turning, facing and boring operations.



Sketch of side view of part showing many of the single-point tool machining operations necessary for the job.

convert to Standard Carboloy Tools and ups, low inventories, lowest tool cost



Dotted lines show the original tip ends of the 4 styles of Standard Tools before they were ground to these 14 special shapes in minutes.

2 **Easy for you to use, also**—Adapting Standard Carboloy Tools to your special-tool needs is a cinch. They can be rough-ground quickly on ordinary silicon carbide wheels, finished economically on diamond wheels. Standard Carboloy Tools stay sharp up to 10 times as long as high-speed steel tools, last 10 times longer, too.

3 **You get quicker tool-ups** – You'll cut tooling delays to minutes instead of days or weeks with "Standards" on your shelves. Your inventories will be lower – costs, too. Just 11 styles of Standard Carboloy Tools can be adapted to do up to 80% of all your single-point tool machining.

4 **You enjoy plant-wide benefits** – Let us help you convert to standard styles of Carboloy Tools – for plant-wide benefits. Thousands of shops have done so . . . and now profit from such things as production gains of up to 300%, downtime savings that alone more than pay for the entire cost of the tools.

To get maximum performance from Standard Carboloy Tools, we have the industry's best all-around Carbide Service Program. Includes all types of free how-to-do-it technical data, a tuition-free training school, etc. For details, mail coupon today.

CARBOLOY TOOLS ARE STOCKED COAST TO COAST BY

AUTHORIZED CARBOLOY CEMENTED CARBIDE DISTRIBUTORS

Look under "Tools" in the Yellow Pages of your local telephone book, or in Thomas' Register, for address and phone number of your nearby Carboloy distributor, branch or district office.

"Carboloy" and "Live-Spiral" are registered trademarks of Carboloy Department of General Electric Company

5 **Send blueprints of your "specials"** – Let us review your single-point tool machining jobs that now require costly special tools . . . show you exactly what "Standards" can be adapted, and how. Send blueprints today to the factory at Detroit, or to your nearest Carboloy District Office. No charge or obligation. See coupon below.

MAIL COUPON TODAY!

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11149 E. 8 Mile Blvd., Detroit 32, Michigan

Gentlemen: Please send me, at no cost or obligation, Carboloy General Tool Catalog, GT-250.

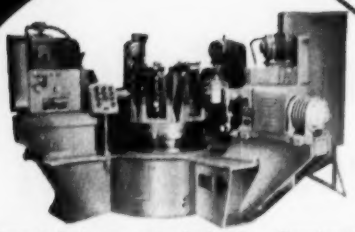
☐ Also, I am enclosing ( ) blueprints or sketches of the single-point tools we use. Show me, free of charge, which low-cost Standard Carboloy Tools can be quickly ground to these special shapes (and how to do it).

Name _____ Position _____

Company Name _____

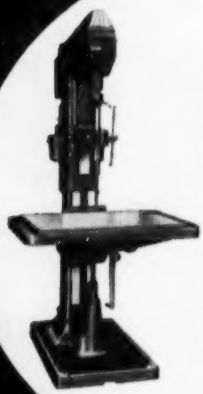
Address _____

City _____ Zone ____ State _____



Special Automatic Indexing Production Drilling and Tapping Machine. Five No. 2 Avey Cam Feed Units and one Lead Screw Tapping Unit mounted horizontally around a 36" diameter, seven station indexing table, automatic, push button operation.

Deep Hole Drilling Machine. One Aveydraulic Deep Hole Drilling Unit, mounted on a sturdy fabricated steel base which contains the hydraulic power source and motor driven coolant system . . . torquematic withdrawal of drill . . . single or double end arrangement.



Standard sensitive and upright single or multiple spindle drilling and tapping machine . . . for holes up to 1½" diameter in Cast Iron. Complete with standard frame . . . reversing or non-reversing motor . . . hand or automatic feed.

Specialists

IN THE MANUFACTURE OF

PRODUCTION DRILLING MACHINERY

- HYDRAULIC DRILLING UNITS
- DEEP HOLE DRILLING UNITS
- CAM FEED DRILLING AND TAPPING UNITS
- WAY TYPE DRILLING AND TAPPING MACHINES
- STANDARD DRILLING AND TAPPING MACHINES
- AUTOMATIC INDEX TABLES

Avey

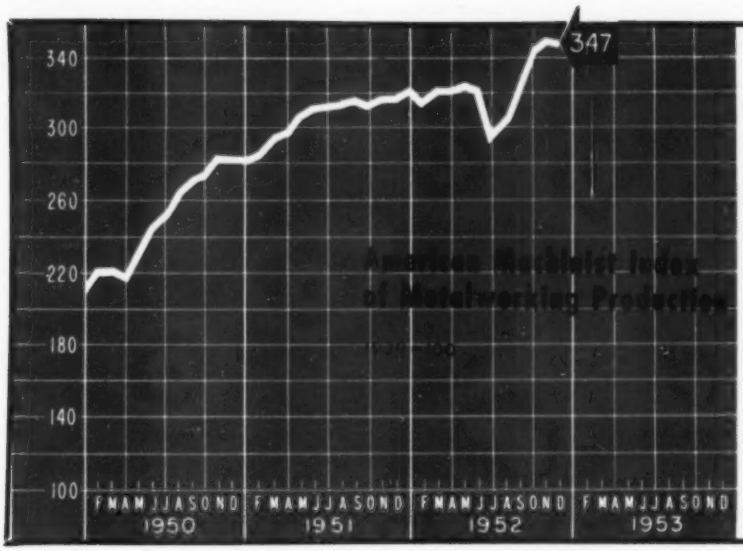
DRILLING MACHINE CO.

CINCINNATI 1, OHIO

WRITE FOR ENGINEERING CATALOG

There's an AVEY to fit your particular job

Gaging Metalworking



PRODUCTION INDEX

BASED ON MANHOURS WORKED IN THE FIVE COMPONENTS

	DEC '52(*)	NOV '52(p)	OCT '52(r)	NOV '51
	347	349	343	311
Machinery	315	309		309
Electrical Machinery	412	398		356
Autos	254	253		216
Other Transportation	573	566		478
Other Metalworking	352	346		307

(*) Estimated (p) preliminary (r) revised

There are few if any signs of slackening in Metalworking. Production over-all clings to the postwar peak attained the fourth quarter.

Metalworking companies should do a whopping business in the January-March period. That applies to a wide range of consumer goods as well as to capital equipment.

• • •

Aircraft will be one of Metalworking's most active industries in '53. Military plane output will be at about the December rate all year—1000 a month. But measured in airframe weight, production will continue to expand into the third quarter.

Employment in the plane industry will go above the 800,000 mark, about 50,000 more than last month.

• • •

West Coast reports indicate a high level of business throughout the first quarter.

Major airframe companies expect a steady rise in production, both military and civilian.

Makers of heaters, gas ranges and related equipment have big backlogs and good incoming orders.

A manufacturer of power switchboards and other electric apparatus is counting on this quarter to be as active as the last half of '52.

Number of Pacific Coast firms say that they are over the hump in defense output. A leveling off will come later in the year.

Except for Bethlehem Pacific's $49 million contract for building five cargo ships, shipbuilding and repair work in private yards is slow.

Here is what the metals situation looks like:

Steel capacity now is 115 million ingot tons. It will go up to about 123 million tons by the year-end. Pre-Korea capacity was 100 million.

Larger sizes of cold-finished rounds and hot and cold finished bar mill flats will be scarce the next few months while the shell program continues so active.

Structurals are starting to ease, but won't be in balance with needs until mid-summer.

Hot and cold rolled sheet is in better supply. Strip, light forging bar stock and all wire products are no longer tight.

Steel warehouses are still about 60% shy of the items they normally carry.

• • •

In aluminum, there will be enough new capacity in place after July to allow free use of this material for the first time since Korea.

A sudden surge in Pacific Northwest power output would enable NPA to beef up second-quarter aluminum allotments.

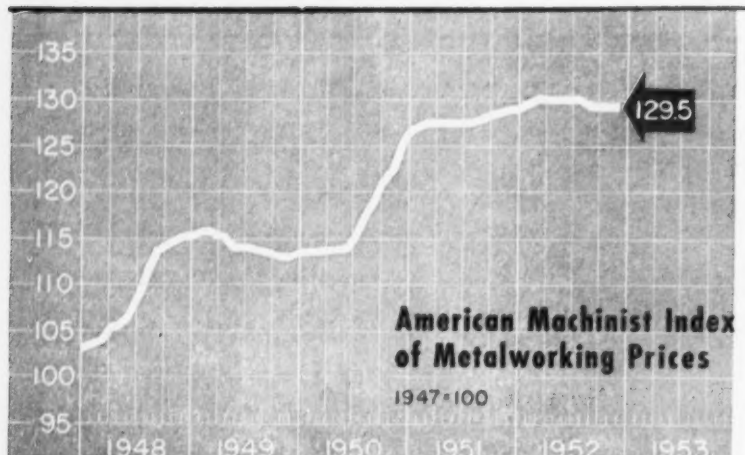
Washington rates these materials as "most critical": Titanium, cobalt, columbium, molybdenum, nickel, tantalum, nickel-bearing stainless steel, diamond bort, and heavy castings (over 3000 lb) of gray iron, gray iron alloy and carbon steel.

Fourteen other metals were classed as "most critical" at this time last year. Now all of them are off the danger list.

Lead and zinc are in fair to good supply. Copper, tin and tungsten are in approximate balance.

In short supply: Cold drawn and hot rolled alloy steel bars, steel plates, structural shapes.

Gaging Business



PRICE INDEX

	DEC '52(*)	NOV '52(p)	OCT '52(r)	NOV '51
	129.5	**129.5**	**129.6**	**128.9**
Metalworking Machinery	**137.7**	**137.9**	**136.7**	
Other Machinery exc. Electrical	**132.2**	**132.1**	**132.4**	
Electrical Machinery	**123.9**	**123.9**	**127.1**	
Fabricated Metal Products	**128.1**	**128.2**	**115.1**	

(*) Estimated (p) preliminary (r) revised

Industrial production, as measured by the Federal Reserve index, is at or close to its peak.

It is 134% above the 1935-1939 average. At the top of the war effort, it was only 5.5% above the current level.

As backlogs tend to shrink, operating rates in some lines are likely to be pared. But production by the end of '53 ought to be down only a small percentage at the worst.

• • •

Don't forget that capital spending will be almost as high this year as last. If anything, it will be larger than manufacturers indicated when polled only two months ago.

Price stability seems assured this year. Prices of basic commodities, after a marked advance following Korea, are about back where they were. Wholesale prices have pointed downward for 21 months.

Best opinion is that when controls are removed, the repercussions will be slight.

With prices firm, consumers may be tempted to buy more goods. Consumer goods sales have picked up sharply the past 50 days.

Installment buying has helped a lot to boost retail sales in recent months. Outstanding consumer credit increased $510 million in November to a total of $22.8 billion. That is $2.8 billion higher than a year ago.

Retail trade in December broke all records. In November it amounted to $13.9 billion, about 4% above the same month of 1952.

• • •

Construction expenditures have hit a new peak, based on dollar volume. But physical volume has been off a bit compared with 1950-1951.

Freight car builders' order books are shrinking. Only 87,657 cars were on order at the end of November. That is the smallest number since August, 1950. It is 40,000 less than a year ago.

Output of freight cars also is down sharply, being about two-thirds of what it was late in '51.

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Business Week Index of Activity (1923-25 = 100)*	250.4	249.7	237.4
Steel ingot production (thousand tons)	2,213	2,226	2,039
Electric power output (million Kilowatt hours)	7,716	7,550	7,149
Production of automobiles and trucks	108,128	102,558	53,601
Engineering construction awards (*Eng. News-Record*, millions)	$322.7	$165.0	$280.7

MONTHLY BUSINESS INDICATORS

	Latest Month	Preceding Month	Year Ago
Refrigerators sales (thousands of units)	279	233	167
Vacuum cleaners sales (thousands of units)	254	292	219
Washers sales (thousands of units)	293	328	314
Household electric ranges sales (thousands of units)	75	64	103
Radio production (thousands of units)	795	772	934
Television production (thousands of units)	780	724	415
Gear sales index (1935-1939 = 100)	516.0	533.1	530.0
Foundry equipment new orders index (shipments, 1937-1939 = 100)	258.1	335.8	305.5

* Seasonally adjusted

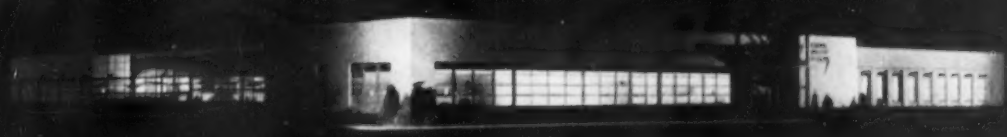
To produce eight single lugs on the end of a steel sleeve was a problem recently given to Detroit Broach.

After analysis of the operation, Detroit Broach recommended a single ram vertical surface broach to do the job. One of the problems within the job, in addition to increasing output, was the necessity of holding a close tolerance between the lugs.

The vertical broaching machine was set up with a two-station fixture which power-clamps the parts. A single pass of the broach forms four lugs across the sleeve. The sleeve is then indexed 90° and the other four lugs are formed. Complete cycle time—33 seconds per completed part. Slot tolerances are easily held and surface finish on the lugs requires no additional machining.

This is just typical of the specialized broaching techniques evolved by Detroit Broach for leading manufacturers. You, too, may have an application that can be materially reduced in time or cost by the economy of broaching or by review of present broach tooling. It will pay you to consult Detroit Broach for engineering or production data.

WORLD'S LARGEST MANUFACTURER OF BROACHES AND BROACHING TOOLS EXCLUSIVELY



DETROIT BROACH COMPANY

20201 SHERWOOD AVE. • DETROIT 34, MICH.

. . . untouched by human hands!

. . . to plus-or-minus .035 oz.!

. . . at 12 per minute rate!

pistons balanced automatically

. . . by this amazing new

Morris

AUTOMATIC PISTON BALANCING MACHINE

For the first time, this MORRIS Mor-Speed Production Machine makes piston balancing 100% automatic. Parts are unloaded automatically from a standard conveyor, processed or rejected and returned to the conveyor "untouched by human hands."

Underweight or grossly overweight pistons are automatically rejected without interrupting the production flow. Depending on a cycle time ranging from 5 to 8 seconds per part, production is 450 to 720 parts per hour varying with the amount of metal to be removed from each piece at 80% efficiency and to a plus-or-minus one gram accuracy limit!

MORRIS Automatic Piston Balancing Machines are used by a number of the major automotive producers. If you have a piston production line, let Morris Engineers show you case history proof of time, labor, money and floor space savings.

Write today for NEW bulletin describing and illustrating the revolutionary MORRIS Piston Balancing Machine.

The Morris Automatic Piston Balancing Machine takes only 27.3 square feet of floor space to turn out up to 12 accurately balanced pistons every minute!

a better product at less cost with precision PLUS production

Builders of MOR-SPEED Line

Morris

THE MORRIS MACHINE TOOL COMPANY, 933 HARRIET ST., CINCINNATI 3, OHIO

American Machinist

MAGAZINE OF METALWORKING PRODUCTION ★ ESTABLISHED 1877

High Security at Low Cost

One of our foremost problems in the cold war is to be ready for a hot war if it ever should come. Our main task is to attain the highest degree of security with the least drain upon the economy.

The Advisory Committee on Production Equipment, popularly known as the Vance Committee, has studied this problem for months. Its final report, just made public, points the way toward achieving that security through a modest outlay of the taxpayers' money.

IF ITS REASONING is followed, we would not spend tens of billions to make weapons in prodigious volume, only to have them rust from disuse and lose their value by obsolescence.

Instead we would build up armament production capacity. We would begin by getting from the armed services a list of weapons wanted in an all-out emergency.

Then a production line for manufacture of each required weapon would be tooled up for a specified output as soon after M-Day as possible. The tooled-up machines would be kept in storage or actually set up ready for action.

From time to time, as better manufacturing processes were developed, these machines would be replaced by newer ones.

PLANES AND GUNS and tanks and ammunition still would be produced in modest volume. But the edge would be off the terrible necessity of having so many weapons of war produced and lying around. The fact that we could get into full war production very quickly would be a powerful deterrent to any potential enemy.

Here is the sort of thing that the Vance Committee's proposed program would do: By spending $500 million for big heavy machines which would be ready for immediate action, we would increase aircraft production $18 billion during the first two years alone of a war period.

Capacity for meeting the maximum war production rate of a certain ordnance item would be created in advance of mobilization at a cost equal to that of producing only 150 units of this item (thousands would be needed in wartime).

It is impossible to discuss the Vance Committee program in detail here. Suffice it to say that it would establish production capacity as more important than a stockpile of quickly outdated weapons. It would keep that production capacity up-to-date. It would develop new machines and production processes concurrently with development of new weapons. It would do everything possible to keep modern the nation's entire industrial plant and the military services' reserve machine tool holdings.

THIS IS A NEW and revolutionary concept of how to shorten the time to get the highest degree of national security and to reduce the cost of maintaining that security over a long span of years.

The concept is sound and reasonable. It deserves prompt and vigorous Congressional endorsement as the nation's official policy. As a starter, Congress should approve the $500 million earmarked in the fiscal 1954 military budget for long-lead-time machine tools.

The Vance Committee has done a great public service in proposing such a bold, sensible and economical solution of a vexing problem.

Burnham Finney

"My New KING does more work than our two old mills - with time left over!"
says "Pop" Thomas, operator of the new 72" KING at Combustion Engineering-Superheater, Inc.
KING
50th ANNIVERSARY
1902-1952
VERTICAL BORING & TURNING MACHINES

Veteran machinist George Thomas really has things humming at the Chattanooga plant of Combustion Engineering-Superheater, Inc. At the time this new KING was installed, output from two other boring mills was running far behind schedule. But under "Pop's" skilled hand, this new 72" KING is producing more work than the former output of the *other two mills combined.*

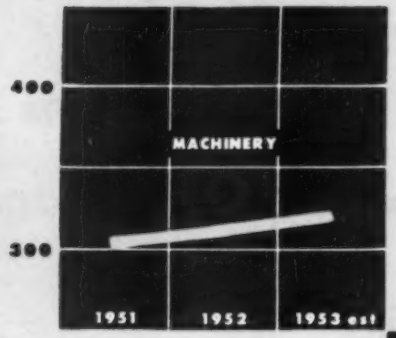
The combination of George Thomas' long experience and KING'S modern design has made possible tremendous cuts in job floor-to-floor time. Take, for example, the work illustrated in the photograph above. The KING is shown machining an 81" dia. x 33" deep steel boiler drum head having 4¼" wall thickness. Operations include turning, boring and facing. Previous machining time was 25 hours. Time with the new KING is 10 hours.

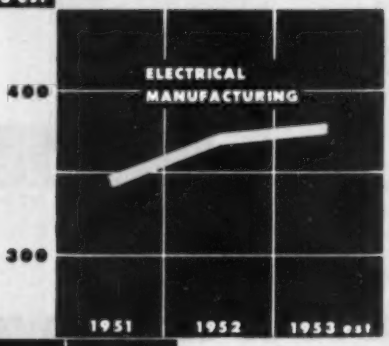
This experience with a New-Series KING Vertical Boring and Turning Machine at one of the nation's leading industrial plants is not unique. It is typical of KING performance in hundreds of other plants engaged in defense and civilian production. KING Mills are made in 10 sizes: 30", 36", 42", 52", 62", 72", 84", 100", 120" and 144". Available in a variety of head combinations.

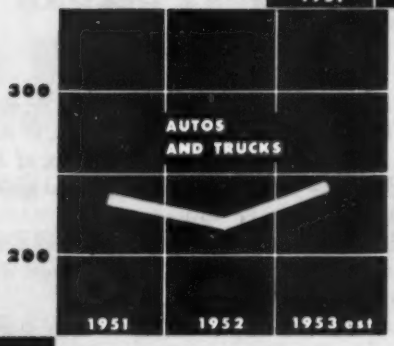
American Steel Foundries

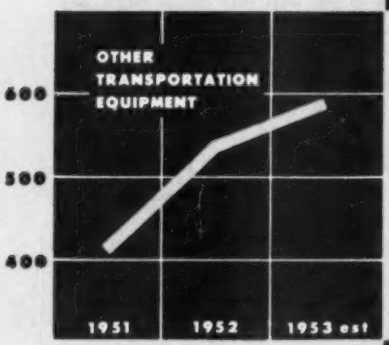
KING MACHINE TOOL DIVISION

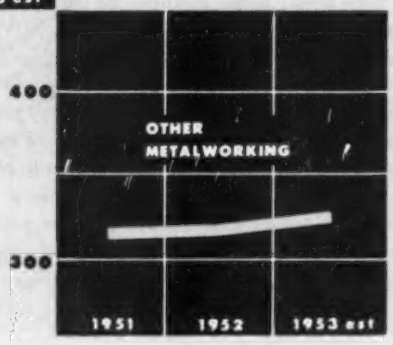
CINCINNATI 29, OHIO









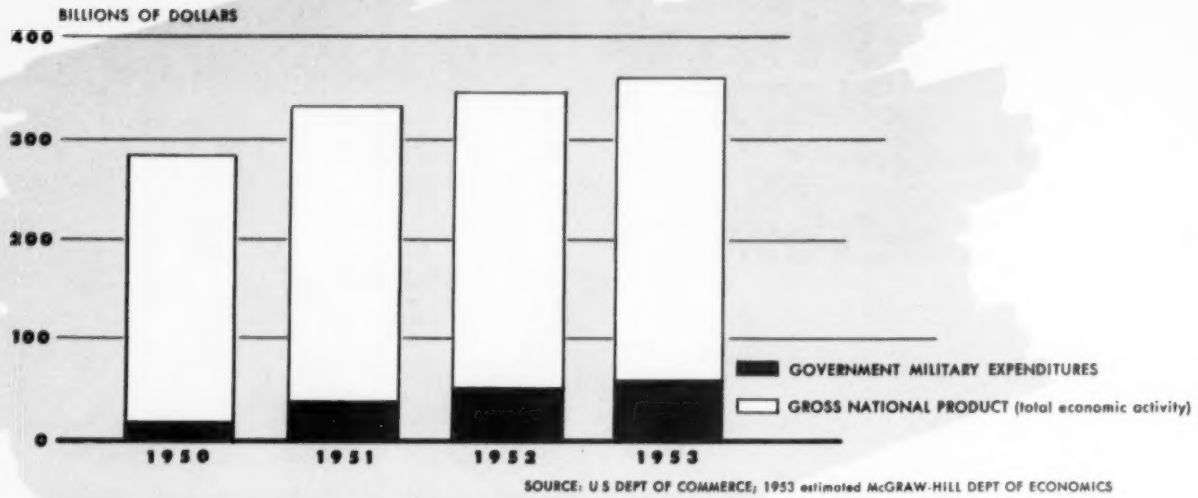


1953 METALWORKING TO STAY NEAR PEAK

HIGHLIGHTS

- **defense production to rise**
- **capital spending to be heavy**
- **consumer durable goods to expand**
- **materials and manpower less critical**

American Machinist METALWORKING FACTS FOR 1953



SOURCE: U S DEPT OF COMMERCE; 1953 estimated McGRAW-HILL DEPT OF ECONOMICS

PRODUCTION TO BE CLOSE TO '52 RECORD

Metalworking will continue operations through 1953 at or near the record pace set in 1952. Production at the beginning of the year is close to, if not at, the peacetime high of 338, as measured on the AMERICAN MACHINIST Index of Metalworking Production (1939 equals 100). The peak rate was attained in the final quarter of '52.

Many metalworking industries, to be sure, are going into the new year with smaller backlogs of orders than they possessed the year previous. But a combination of abnormally high pile-ups of bookings and a good inflow of new business should keep metalworking shops humming for many months ahead.

Defense production will be in full stride. Though the peak will not be as high as anticipated, the volume over-all will be impressive. Metalworking is the heart of the program – planes, tanks, guns, shell, electronic equipment, military vehicles, a thousand-and-one other items. Metalworking output will be sustained too by a large outpouring of civilian goods of all kinds, especially such consumer durable goods as automobiles, electric appliances and TV sets (of which some 7 million may be made).

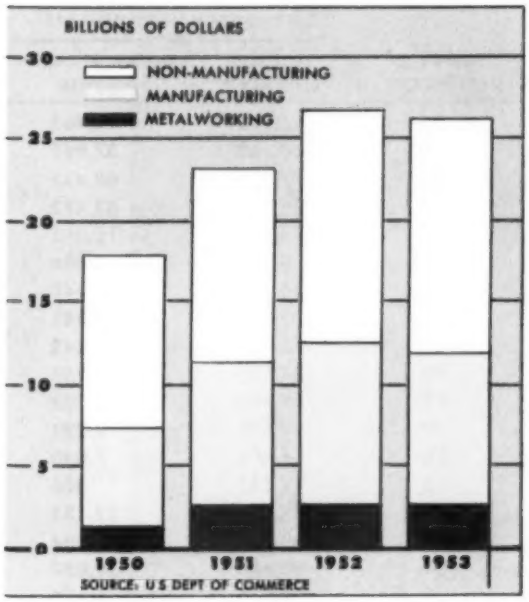
Expenditures for new plant and equipment this year will be only a shade less than the record outlay of $26.9 billion in 1952. That fact alone will have terrific impact upon the capital goods industries which are mainly in the metalworking field.

Though armament production will rise this year, there will be a considerable switch back from a defense economy to a civilian economy. This will be a stimulant to metalworking operations. More raw materials will be available for peacetime products than at any time since Korea. What's more, more manufacturing facilities are at hand and the manpower situation is expected to be satisfactory.

In 1953 the seller's market will have almost disappeared in all segments of Metalworking. Competition again will rule – with products of new design, hard-hitting selling organizations, and low-cost manufacturing counting more than ever.

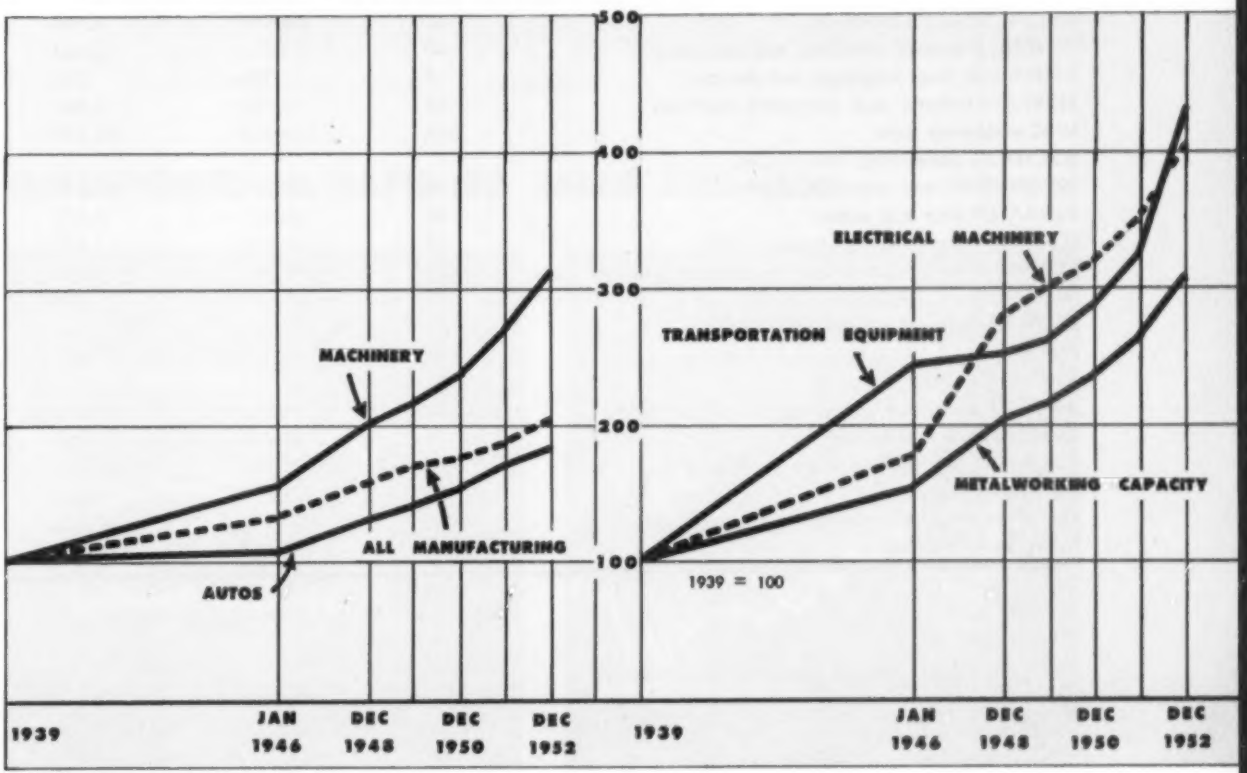
A quick look at some metalworking lines shows that: Power-generating equipment and other heavy electrical goods will be built in large volume this year. Farm implement and construction machinery makers should have a better year than in '52. Automobile, appliance and TV-set producers will register gains. Production equipment builders, including machine-tool companies, will have a big year. Altogether, 1953 looks like a year of near-peak proportions in the metalworking industries.

CAPITAL SPENDING TO STAY AT PEAK



	MILLION DOLLARS ACTUAL			PLANS
	1950	1951	1952	1953
MANUFACTURING	$7,491	$11,141	$12,452	$11,907
PRIMARY IRON AND STEEL	599	1,310	1,681	1,391
NONFERROUS METALS	134	312	502	376
FABRICATED METAL PROD.	350	430	350	360
ELECTRICAL MACHINERY	245	355	389	454
MACHINERY	411	638	763	820
MOTOR VEHICLES	510	797	810	686
TRANSPORTATION EQUIP.	82	227	214	160
STONE, CLAY AND GLASS	280	380	293	280
FOOD	523	631	634	589
BEVERAGES	237	299	381	416
TEXTILES	450	676	512	380
PAPER	327	494	433	424
CHEMICALS	771	1,266	1,507	1,450
PETROLEUM	1,587	2,040	2,494	2,651
RUBBER	102	187	245	271
ALL OTHER MANUFACTURING	883	1,098	1,244	1,199
MINING	684	806	850	871
RAILROAD	1,136	1,564	1,398	1,120
TRANSPORTATION & COMMUNICATION	437	517	1,394	1,384
PUBLIC UTILITIES	3,167	3,654	3,964	4,017
COMMERCIAL AND MISCELLANEOUS	4,917	5,443	6,804	6,972
GRAND TOTAL	17,832	23,126	28,680	26,271

METALWORKING TRIPLE PREWAR SIZE

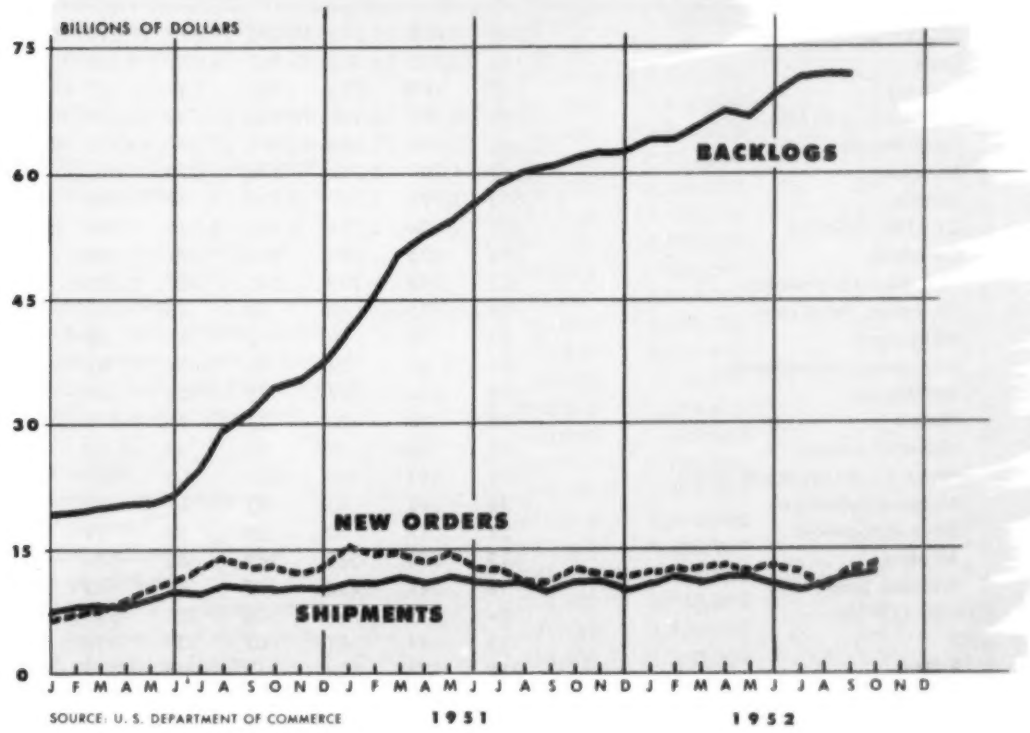


SOURCE: McGRAW-HILL DEPT OF ECONOMICS

CERTIFICATES OF NECESSITY GRANTED (to Sept. 15, 1952)

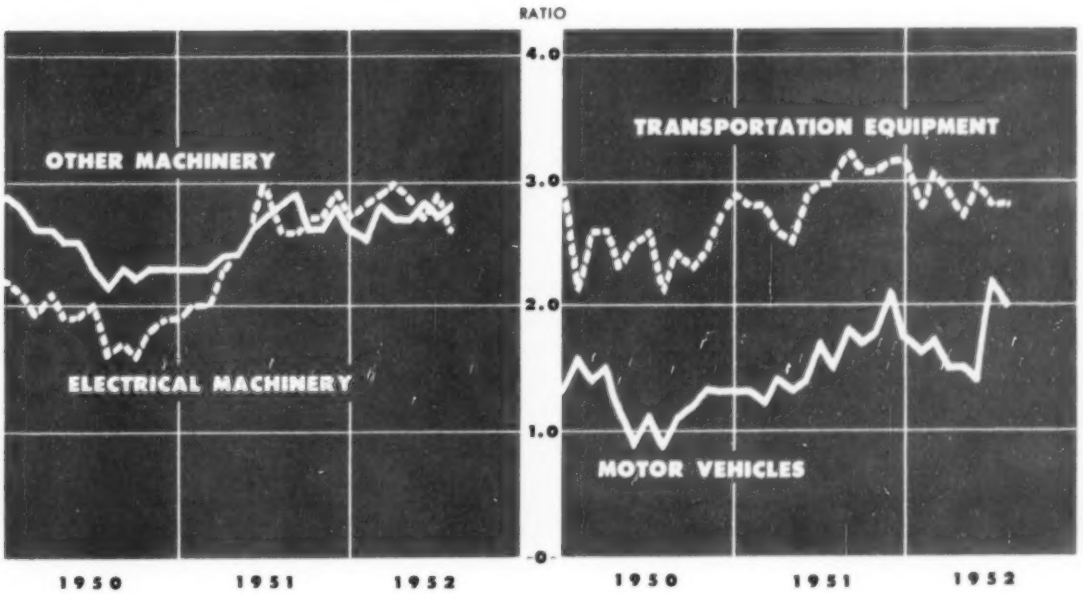
	NUMBER OF CERTIFICATES	THOUSANDS OF DOLLARS	
		PROPOSED INVESTMENT	TAX AMORTIZATION ALLOWED
GUNS, Howitzers, Mortars and related equipment	54	15,623	10,465
AMMUNITION except small arms	234	60,269	37,962
TANKS and tank components	180	97,827	68,425
LIGHTING and fire control equipment	64	49,820	33,492
SMALL arms	40	14,728	10,012
SMALL arms ammunition	22	6,749	4,406
ORDNANCE and accessories	87	20,728	14,249
CUTLERY, handtools and general hardware	24	3,925	2,381
HEATING apparatus, except electrical	13	3,403	1,848
FABRICATED structural metal products	79	34,155	17,259
METAL stamping, coating and engraving	72	9,690	5,502
LIGHTING fixtures	9	3,687	2,291
FABRICATED wire products	56	14,695	7,040
MISC fabricated metal products	2	585	316
ENGINES and turbines	21	42,907	22,133
AGRICULTURAL machinery and tractors	14	60,486	27,094
CONSTRUCTION, mining and similar machinery	104	60,684	29,052
OIL field machinery and tools	9	2,016	1,176
MACHINE tools	406	130,318	89,198
METALWORKING machinery, except machine tools	103	33,224	17,582
MACHINE tool accessories etc.	495	56,000	35,603
SPECIAL industrial machinery	47	16,856	8,768
GENERAL industrial machinery and equipment	40	12,515	6,633
OFFICE and store machines and devices	2	323	248
SERVICE — Industry and household machines	18	5,906	4,206
MISC machinery parts	564	144,059	93,839
ELECTRICAL generating, transmission DISTRIBUTION and industrial apparatus	268	168,670	98,215
INSULATED wire and cable	46	16,860	7,433
ELECTRICAL equipment for transportation	47	21,003	14,476
COMMUNICATION equipment and related products	452	191,828	115,989
MISC electrical products	32	19,181	11,234
MOTOR vehicles and equipment	184	115,294	74,944
AIRCRAFT	155	145,546	88,601
AIRCRAFT and engine parts	411	520,819	348,251
AIRCRAFT propellers and parts	33	19,003	12,819
SHIPBUILDING & repairing	28	23,699	13,781
AIRCRAFT parts and auxiliary equipment	675	225,758	143,781
RAILROAD equipment	11	12,315	5,652
PROFESSIONAL, scientific and controlling instruments	216	129,954	69,842
TOTAL METALWORKING	**5,317**	**2,511,108**	**1,556,198**

DURABLE GOODS BACKLOG EQUAL TO SIX MONTHS' PEAK OUTPUT



SOURCE: U. S. DEPARTMENT OF COMMERCE

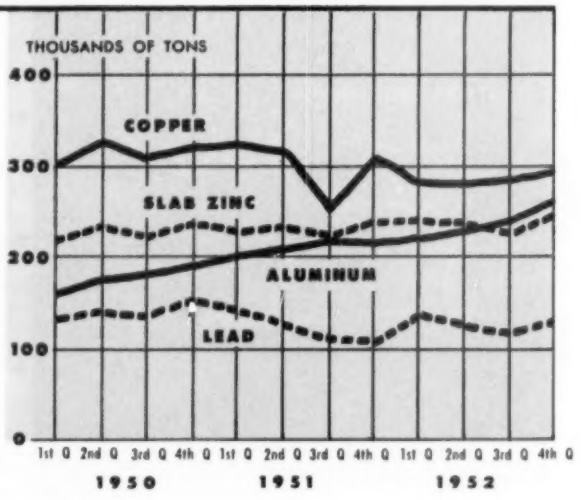
INVENTORIES IN RATIO TO SALES ARE HIGH



RAW MATERIALS OUTPUT TO BE HIGHER IN 1953

	1951				1952			
	1st Q	2nd Q	3rd Q	4th Q	1st Q	2nd Q	3rd Q	4th Q
PIG IRON (thousand tons)	16,806	17,828	17,795	18,085	17,892	11,627	12,818	18,500
Basic	13,184	13,985	14,003	13,963	14,065	9,124	10,024	15,000
Foundry	807	795	791	793	729	623	677	800
STEEL INGOTS AND CASTINGS	25,680	26,592	26,100	27,346	27,780	18,130	19,788	28,500
Open Hearth	22,840	23,596	23,046	23,890	24,447	15,945	17,190	24,900
Bessemer	1,167	1,204	1,253	1,316	1,216	695	720	1,220
Electric	1,673	1,792	1,757	2,132	1,158	1,404	1,730	2,200
ALLOY STEEL INGOTS	2,062	2,184	2,114	2,190	2,228	1,563	1,630	2,685
Chromium	286	375	387	392	392	256	280	469
Chromium-Molybdenum	223	198	209	242	307	250	244	368
Chromium-Vanadium	18	25	40	50	46	15	12	30
Manganese	63	79	69	75	75	43	66	115
Manganese-Molybdenum	65	87	56	84	54	33	43	68
Molybdenum	178	104	77	75	101	69	82	136
Nickel	35	38	22	23	10	7	6	12
Nickel-Chromium	33	35	29	34	39	22	24	41
Nickel-Chromium-Molybdenum	471	585	565	562	503	309	312	529
Nickel-Molybdenum	48	42	43	43	41	26	30	41
Silico-Manganese	31	27	30	28	28	19	23	27
All other	612	591	583	582	632	514	507	861
Stainless Steel	218	227	236	235	251	162	196	275
REFINED COPPER	324	322	247	306	291	288	290	295
LEAD	143	129	107	107	137	124	120	130
SLAB ZINC	232	236	224	241	246	244	231	250
ALUMINUM	201	203	221	217	226	235	241	260
CASTINGS	528	556	533	532	532	490	445	550
Steel	4,038	4,063	3,700	3,518	3,526	3,141	2,800	3,600
Gray Iron	283	287	258	258	251	245	190	255
Malleable	155	153	136	140	132	120	113	130
Copper and Copper Base Alloy	62	65	60	65	70	71	50	70
Aluminum and Aluminum Base Alloy	63	58	52	58	54	54	68	73
COMMERCIAL STEEL FORGINGS	418	475	455	533	412	382	300	425

More raw materials will be produced in 1953 than in 1952. Steel, copper and aluminum will top last year's record. Only lead and zinc production will be lower in '53. Output of steel ingots and castings in 1952 was 94.1 million tons, or 11 million tons below the 1951 total. Steel should hit a new peak of 110 million tons this year. Aluminum still is expanding, with output in '53 estimated at 1.4 million tons. Copper demand continues ahead of supply. New mines will open this year, with government taking most of the tonnage.



NEW STEEL RECORD TO BE SET THIS YEAR

	NET TONS		RELATIVE IMPORTANCE	
	1951	1952	1951	1952
STEEL for converting and processing	4,186,151	3,177,000	5.3%	4.7%
FORGINGS (other than automotive)	1,550,151	1,400,000	2.0	2.1
BOLTS, nuts, rivets, & screws	1,598,735	1,260,000	2.0	1.9
JOBBERS, total	14,399,432	13,450,000	18.2	19.9
Oil and gas industry	1,681,984	1,450,000	2.1	2.1
All others	12,717,448	12,000,000	16.1	17.8
CONSTRUCTION including maintenance	9,583,500	7,750,000	12.1	11.5
CONTRACTORS products	3,080,273	2,600,000	3.9	3.8
AUTOMOTIVE total	12,982,356	10,500,000	16.4	15.5
Passenger cars, trucks, parts, etc.	12,461,458	10,100,000	15.8	14.9
Forgings	520,898	400,000	.7	0.6
RAIL transportation total	5,781,589	3,914,000	7.3	5.8
Railroad rails, trackwork and equipment	2,256,813	1,750,000	2.9	2.6
Freight cars, passenger cars, locomotives	3,477,343	2,125,000	4.4	3.1
Street railways and rapid transit systems	47,433	39,000	0.1	0.1
SHIPBUILDING and marine equipment	884,210	1,000,000	1.1	1.5
AIRCRAFT	150,779	130,000	.2	0.2
OIL and gas drilling	834,632	750,000	1.1	1.1
MINING, quarrying and lumbering	374,769	325,000	0.5	0.5
AGRICULTURAL total	1,638,456	1,400,000	2.1	2.1
Agricultural machinery	1,389,872	1,180,000	1.8	1.8
All other agricultural	248,584	220,000	.3	0.3
MACHINERY, industrial equipment and tools	4,245,167	3,750,000	5.4	5.5
ELECTRICAL machinery and equipment	2,021,123	1,550,000	2.6	2.3
APPLIANCES, utensils, and cutlery	1,836,807	1,300,000	2.3	1.9
OTHER domestic and commercial equipment	2,030,669	1,500,000	2.6	2.2
CONTAINERS, total	6,523,954	5,650,000	8.3	8.4
Cans and closures	4,477,145	4,200,000	5.7	6.2
Barrels, drums and shipping pails	1,246,081	850,000	1.6	1.3
All other containers	800,728	600,000	1.0	0.9
ORDNANCE and other military	1,200,211	2,100,000	1.5	3.1
EXPORT	2,764,411	3,200,000	3.5	4.7
UNCLASSIFIED	1,261,575	875,000	1.6	1.3
TOTAL	78,928,950	67,581,000	100.0%	100.0%

More steel will be produced in 1953 than ever before in history. This is the result of the steel industry's expanded facilities, the building of which began shortly after Korea.

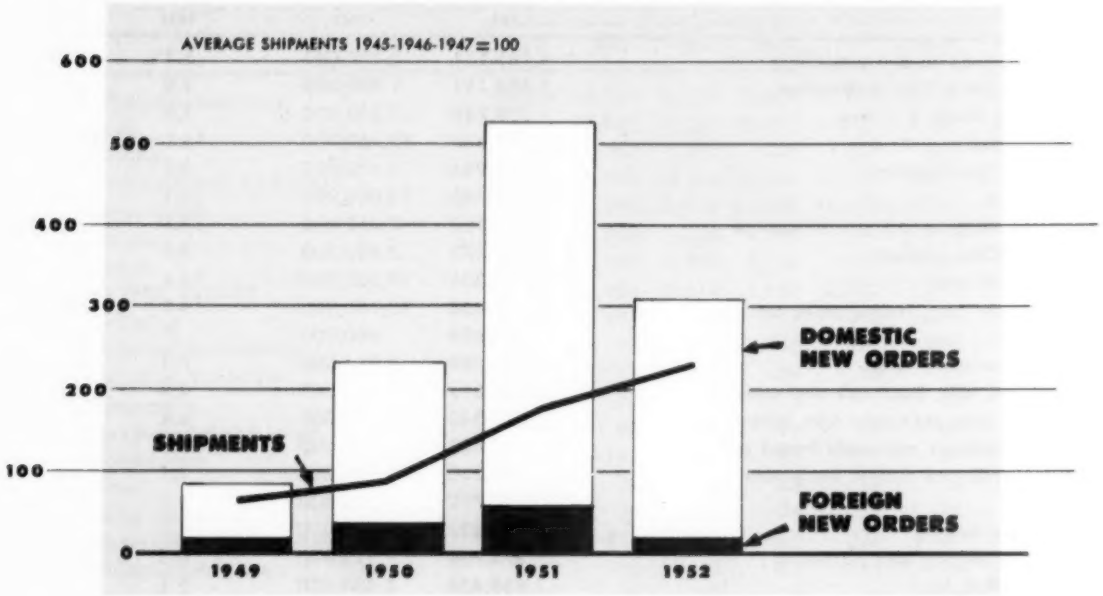
The civilian economy will get a bigger share of steel production this year than in either 1952 or 1951. The past two years defense and defense-supporting industries received about 40% of the finished steel shipped by the nation's mills. This year around one-quarter of the steel tonnage will go to defense projects or to defense-supported industries. That will leave three-quarters for normal peacetime purposes.

Steel's performance the past year was colored by the prolonged nation-wide steel strike. Shipments were lower than in the previous year. The automotive industry, steel's largest single customer, was badly squeezed. Its share was sliced from a normal 20% to only 15%. This situation will not hold in '53, however. Detroit will increase its share, and the over-all total will be greater.

Steel jobbers and warehouses got more steel than any other class of user in 1952. The figures show that their "take" was one-fifth of all the finished steel produced. That is an indication of the high demand for steel from small business. And it is proof that the mills are looking after "the little fellow."

Producers of ordnance and other military items doubled their share of the steel tonnage last year. However, their volume still is relatively small, amounting to less than 2 million tons.

MACHINE TOOL SHIPMENTS RISE AS ORDERS DROP



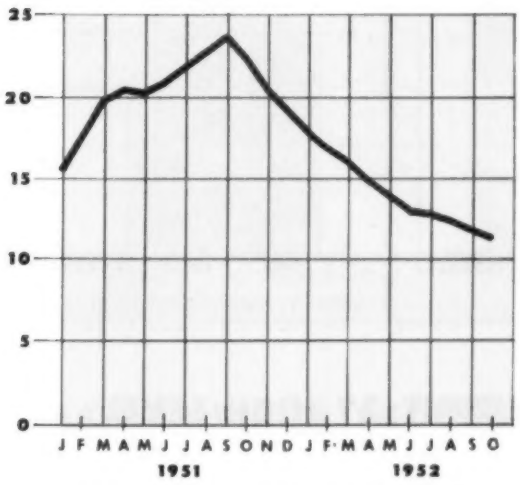
1949	NEW ORDERS	FOREIGN ORDERS	SHIPMENTS
JAN	87.0	21.9	68.8
FEB	80.9	26.5	70.3
MAR	93.5	22.3	75.8
APR	70.1	23.1	74.7
MAY	63.7	15.8	72.8
JUN	53.6	15.7	79.0
JUL	48.0	14.0	60.7
AUG	51.5	18.8	67.3
SEP	57.7	13.7	67.6
OCT	56.8	13.7	62.3
NOV	84.3	17.0	67.6
DEC	82.5	22.4	75.7

1950	NEW ORDERS	FOREIGN ORDERS	SHIPMENTS
JAN	99.7	26.7	52.8
FEB	89.2	18.8	56.1
MAR	107.4	24.9	75.3
APR	98.9	17.4	61.6
MAY	116.4	18.4	82.5
JUN	124.1	23.0	91.9
JUL	253.1	22.3	68.3
AUG	305.1	34.2	95.7
SEP	280.6	27.2	101.6
OCT	289.6	49.5	100.9
NOV	291.9	26.6	110.9
DEC	410.1	112.8	135.7

1951	NEW ORDERS	FOREIGN ORDERS	SHIPMENTS
JAN	475.4	61.3	114.3
FEB	615.5	78.2	123.8
MAR	590.3	102.1	158.9
APR	516.1	66.1	157.7
MAY	483.0	35.7	175.1
JUN	558.8	56.4	182.8
JUL	490.6	54.9	144.7
AUG	488.9	58.7	178.9
SEP	380.2	27.0	189.8
OCT	403.9	41.1	221.3
NOV	330.5	29.0	226.0
DEC	376.5	18.3	264.7

1952	NEW ORDERS	FOREIGN ORDERS	SHIPMENTS
JAN	347.8	33.6	266.6
FEB	318.8	14.4	279.6
MAR	324.3	23.3	299.5
APR	293.5	15.6	307.9
MAY	284.6	31.4	323.0
JUN	342.9	20.3	330.8
JUL	376.3	14.9	259.7
AUG	311.1	22.7	317.0
SEP	302.4	23.1	368.3
OCT	243.3	22.5	357.8
NOV	p210.1	p14.3	p338.2
DEC			

MACHINE TOOL BACKLOGS DOWN TO 10 MONTHS



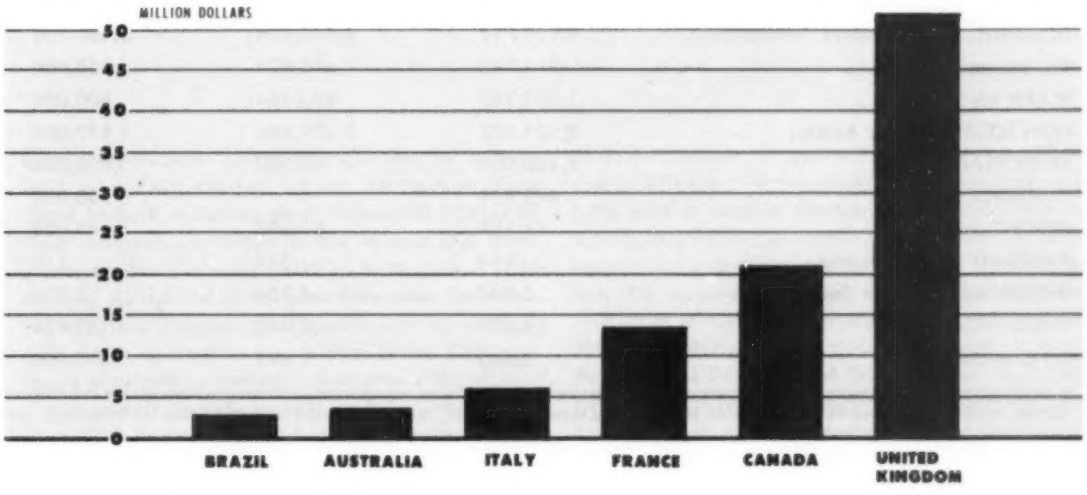
MACHINE TOOL EXPORTS UP SHARPLY IN 1952

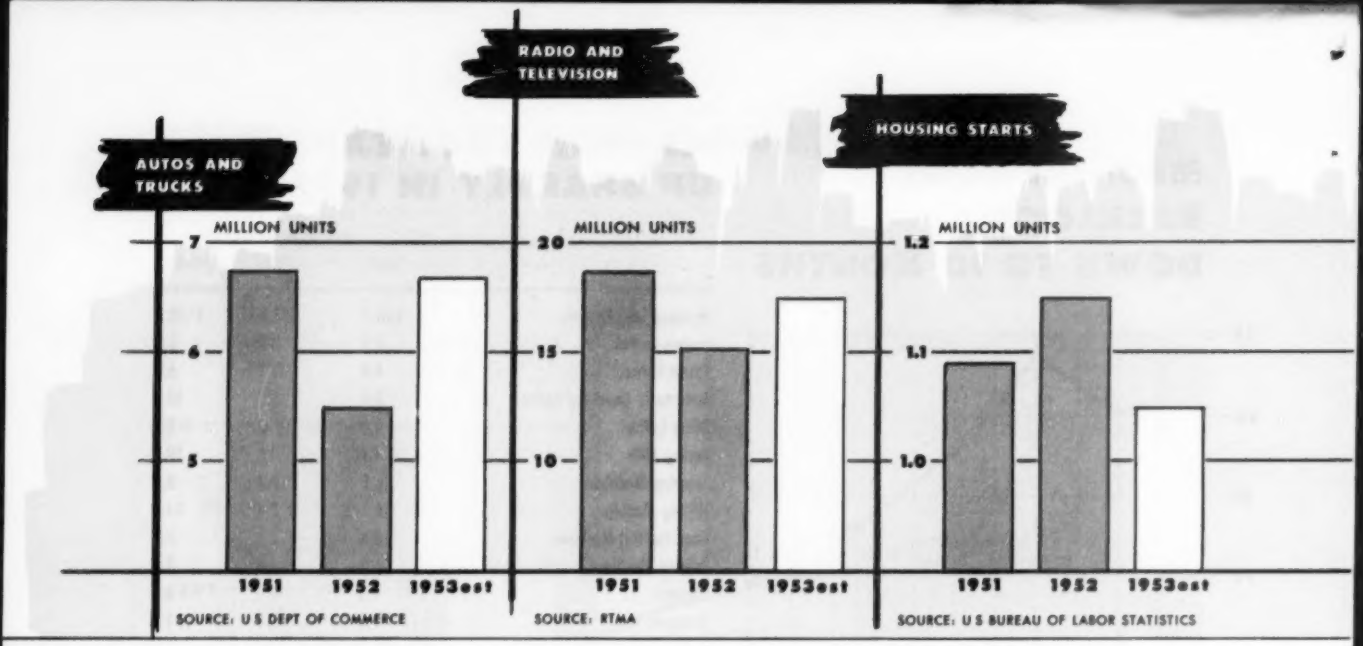
	MILLION DOLLARS		
	1950	1951	1952
Machine Tool Exports	$66.5	$73.0	$120.0
Engine Lathes	4.3	5.9	6.0
Turret Lathes	4.0	4.0	8.0
Automatic Chucking Lathes	5.4	5.9	10.0
Other Lathes	0.4	.8	2.0
Boring Mills	4.9	3.6	10.0
Tapping Machines	6.2	7.7	8.5
Milling Machines	8.1	7.7	14.5
Gear Cutting Machines	5.4	5.1	9.5
Drilling Machines	4.0	2.8	3.3
Planers	1.3	1.0	0.7
Scrapers	0.6	0.9	1.0
Surface Grinders	2.0	2.2	3.7
External Grinders	3.6	3.3	10.5
Internal Grinders	1.9	2.2	7.5
Tool and Cutting Grinders	2.0	3.4	3.0
Other Metal Grinding Machines	4.1	3.8	6.0
Other Metalworking Machinery	7.6	7.0	8.3

Machine tool shipments in 1952 totaled about $1.2 billion. That was double the 1951 volume and almost four times the 1950 figure. Orders suffered as defense stretchouts developed and as cancellations from the Air Force piled up. The result was that backlogs dropped sharply as the year progressed, and by year's end the industry had about 10 months' business on its books. That was the lowest level since October 1950.

Exports of machine tools in 1952 were almost double those in the previous year, amounting to $122 million. Shipments to British defense plants accounted for the biggest slice of foreign business.

BRITISH TOOK BIGGEST SHARE OF EXPORTS

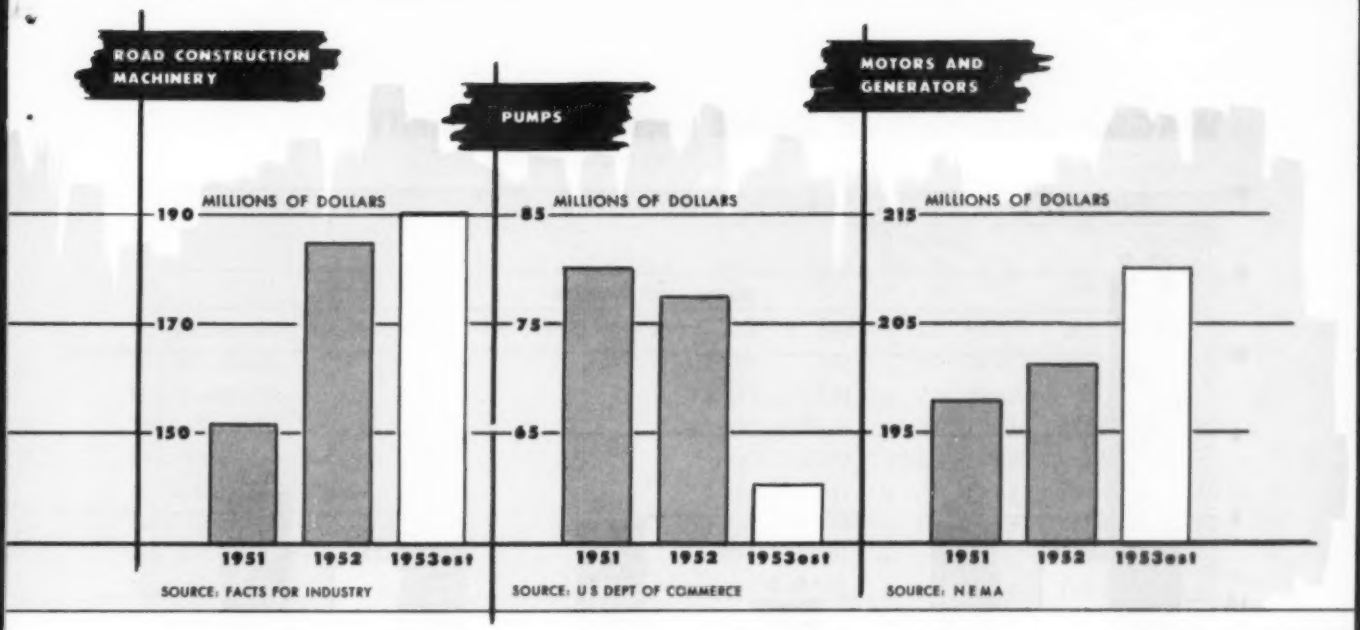




CONSUMER DURABLE GOODS OUTPUT AT HIGH LEVEL . . .

	1950	1951	1952
HOUSING starts	1,396,000	1,091,000	1,150,000
PASSENGER cars and trucks (U.S.)	8,016,366	6,758,148	5,500,000
TRUCK trailers	64,617	67,380	57,000
TELEVISION sets	7,463,800	5,384,798	6,000,000
PORTABLE radios	1,674,700	1,332,990	1,375,000
CAR radios	4,740,600	4,542,920	2,600,000
CLOCK radios		777,155	1,625,000
HOME radios	8,174,000	6,751,452	3,600,000
WASHERS (electric and gas) standard size	4,290,000	3,301,113	3,050,000
IRONING machines	409,200	277,900	190,000
VACUUM cleaners (floor type)	3,529,400	2,729,104	2,800,000
RANGES	1,830,000	1,400,000	880,000
DOMESTIC cooking stoves (non-electric)	3,384,463	2,622,828	2,300,000
DOMESTIC heating stoves (non-electric)	4,192,744	4,142,076	3,500,000
OIL burners	913,743	693,624	650,000
WARM air furnaces	1,093,189	865,164	800,000
NON-ELECTRIC water heaters	2,909,502	2,327,496	1,850,000
REFRIGERATORS	6,200,000	4,100,000	3,350,000
TRACTORS	692,951		500,000
FREIGHT cars	44,209	95,988	85,000
RAILROAD passenger cars	964	312	110
INDUSTRIAL electrical trucks	2,808	5,784	8,000
MECHANICAL stokers	24,679	23,940	22,900
CIVIL aircraft	3,520	2,472	3,000

SOURCE: ELECTRICAL MERCHANDISING, NATIONAL ELECTRICAL MANUFACTURERS ASSN., BUREAU OF LABOR STATISTICS, DEPT. OF COMMERCE, FACTS FOR INDUSTRY, RAILWAY AGE.



AS INDUSTRIAL PRODUCTS MAKERS END LUSH YEAR

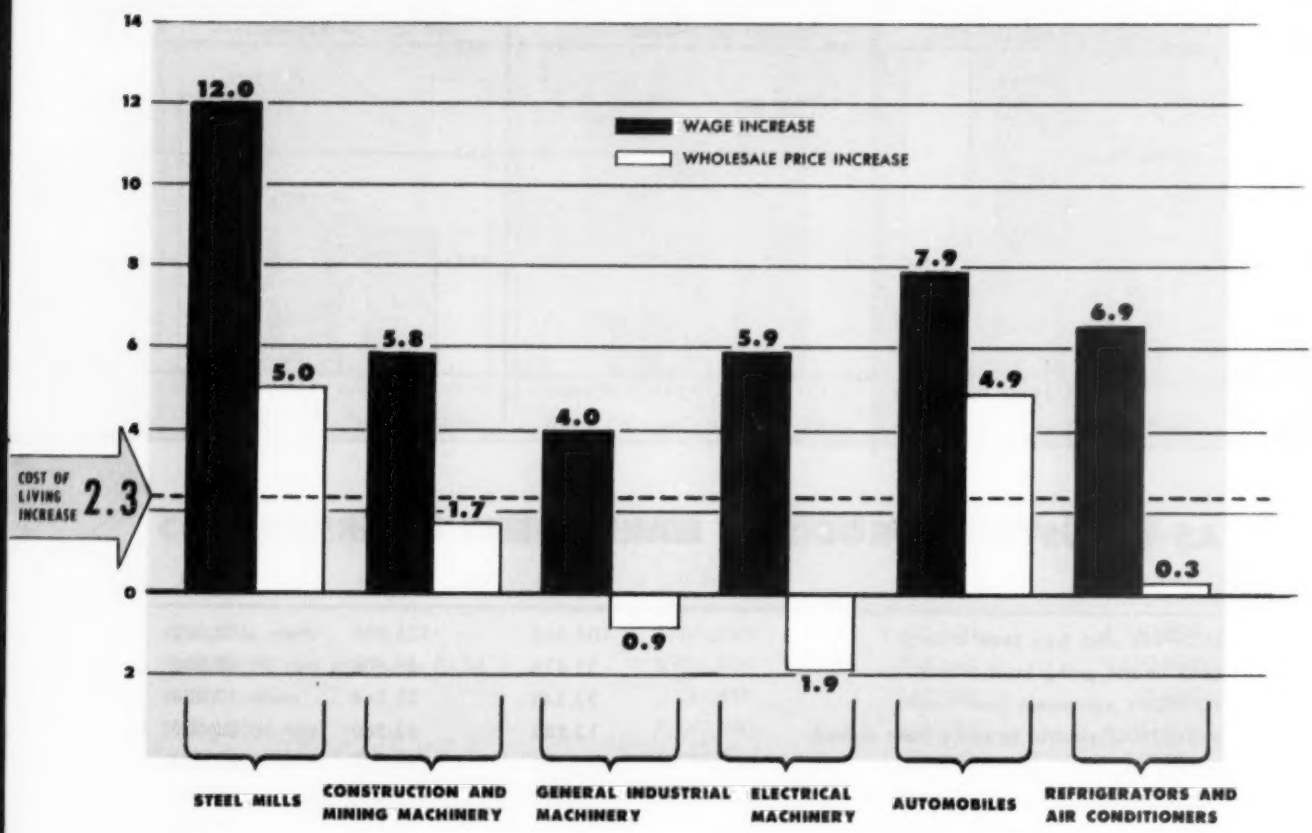
	1950	1951	1952
BLOWERS and fans (new orders)	107,663	135,908	133,000
UNIT heater group (new orders)	52,816	61,608	55,000
FOUNDRY equipment (new orders)	23,345	23,264	17,800
INDUSTRIAL electric furnaces (new orders)	13,882	43,500	26,500
PUMPS (new orders)	53,401	80,208	77,500
POLYPHASE induction motors (shipments)	111,935	171,683	170,000
DIRECT current motors and generators (shipments)	17,417	26,223	31,000
TRACKLAYING tractors (shipments)	223,042	263,579	325,000
POWER cranes and shovels (shipments)	109,006	180,680	200,000
ROAD construction and maintenance machinery (shipments)	117,540	151,779	185,000
GEAR sales (index 1935-1939 = 100)	457.2	695.6	497.0

Consumer durable goods did not fare as well in 1952 as in 1951. Output, on the whole, was down about 15%. Two factors were responsible: Demand from customers declined in the second and third quarters; and the steel strike took its toll of production. As the end of the year drew near, however, the situation changed. Retail sales were up sharply and output spurted to a very high level. This condition promises to continue well into 1953.

Automobile makers in 1952 had the lowest year since 1948. Assemblies of 5.5 million cars and trucks would have been considered lush by prewar standards, but not in relation to postwar volume. This year, production is expected to rise to 6.6 million cars and trucks. On the other hand, competition is back and a buyer's market rules. Television set manufacturers had a terrific final quarter in '52, in output and sales. Inventories are low. Opening of new TV stations is bound to spur sales this year.

Makers of industrial products had a big year in 1952. New records in shipments were made in many lines. At the beginning of '53 orders on hand were equal to six months' production. But incoming business in recent months has not kept up to the rate which prevailed during 1951, when the defense program was just getting going.

WAGES RISE FASTER THAN PRICES



Even with wage and price controls, wages went up in 1952 much faster than prices. That is true in almost all segments of Metalworking.

The basic steel industry provided the most spectacular example of wage increases which ran far ahead of price increases. As a result of the nationwide steel strike, mills granted their workers a 12% boost in pay. Prices, on the other hand, rose 5%.

If you look in any portion of Metalworking, you'll find virtually the same situation as in the steel industry. Take construction and mining machinery. The rise in wages last year totaled 5.8%. Prices, by contrast, increased only 1.7%.

At least two metalworking segments offer an even more striking disparity. In electrical machinery, wages jumped 5.9%. But prices actually declined 1.9%. The same situation held in general industrial machinery, with wage rates being hiked up 4% and prices going down 0.9%.

Wages rose 5% last year, on an over-all basis. About the same increase is expected this year. There is a good chance, in fact, that they may be less than that figure.

The possibility of prices coming down in '53 is becoming more remote every day. Retail prices are likely to stay very stable all year. There may be mild fluctuations in wholesale prices, however.

If wage and price controls are lifted this year, prices in some items might go up sharply for a short time. Informed opinion believes that they cannot stay up because of the current balance between supply and demand in most lines.

The cost of living increased 2.3% during the past year.

WAGES CONTINUE UP IN ALL METALWORKING LINES

	WAGES			PRICES		
	SEPT. 1951	SEPT. 1952	% INCREASE SEPT. 1951 SEPT. 1952	SEPT. 1951	SEPT. 1952	% INCREASE SEPT. 1951 SEPT. 1952
All Manufacturing Industries	$1.613	$1.693	+ 5.0	N.A.	N.A.	N.A.
Durable Goods	1.707	1.805	+ 5.7	N.A.	N.A.	N.A.
Non-Durable Goods	1.489	1.546	+ 3.8	N.A.	N.A.	N.A.
Steel Mills	1.920	2.135	+12.0	124.9	131.1	+ 5.0
Gray Iron Foundries	1.665	1.770	+ 6.3	114.8	116.7	+ 1.7
Malleable Iron Foundries	1.731	1.851	+ 7.0	128.0	134.1	+ 4.8
Steel Foundries	1.767	1.858	+ 5.1	121.1	121.3	+ 0.2
Iron & Steel Forgings	1.975	2.001	+ 1.3	N.A.	N.A.	N.A.
Wire Drawings	1.875	1.973	+ 5.2	134.6	142.0	+ 5.5
Tin Cans & Other Tinware	1.682	1.706	+ 1.4	125.1	128.3	+ 2.6
Cutlery & Edge Tools	1.466	1.554	+ 6.0	126.6	124.1	— 0.1
Hand Tools	1.645	1.692	+ 2.9	124.9	127.2	+ 1.8
Hardware	1.634	1.759	+ 7.6	124.8	123.8	— 0.8
Oil Burners, Non-Electrical Heating & Cooking Apparatus	1.624	1.727	+ 6.3	105.7	105.7	0
Structural Steel & Ornamental Metalworking	1.709	1.793	+ 4.9	116.2	115.6	— 0.5
Boiler Shop Products	1.702	1.809	+ 6.3	104.1	114.2	+ 9.6
Sheetmetal Work	1.699	1.818	+ 7.0	104.1	114.2	+ 9.6
Stamped & Pressed Metal Products	1.755	1.909	+ 8.8	119.4	120.6	+ 1.0
Machinery Except Electrical	1.788	1.871	+ 4.6	120.8	122.4	+ 1.3
Engines & Turbines	1.876	1.944	+ 3.8	122.1	126.9	+ 3.9
Tractors	1.863	1.853	— 0.5	137.4	117.9	—14.2
Agricultural Machinery Except Tractors	1.963	1.786	— 9.0	112.1	112.8	+ 0.6
Construction & Mining Machinery	1.695	1.793	+ 5.8	123.7	125.8	+ 1.7
Machine Tools	1.866	1.927	+ 3.3	N.A.	N.A.	N.A.
Metalworking Machinery Except Machine Tools	1.835	1.933	+ 5.3	125.7	129.2	+ 2.8
Machine Tool Accessories	1.924	2.080	+ 8.1	113.9	121.3	+ 6.5
Special Industrial Machinery	1.722	1.817	+ 5.5	N.A.	N.A.	N.A.
General Industrial Machinery	1.768	1.839	+ 4.0	123.5	122.3	— 0.9
Computing Machinery & Cash Registers	1.944	2.040	+ 4.9	111.8	110.9	— 0.8
Typewriters	1.606	1.706	+ 6.2	105.6	111.8	+ 5.9
Service, Industrial & Household Machinery	1.761	1.859	+ 5.6	107.3	107.5	+ 0.2
Refrigerators & Air Conditioning Units	1.761	1.876	+ 6.5	105.0	105.3	+ 0.3
Electrical Machinery	1.640	1.736	+ 5.9	122.1	119.7	— 1.9
Communication Equipment	1.523	1.616	+ 6.1	92.9	93.7	+ 0.9
Radios, Phonographs, Television Sets & Equipment	1.456	1.540	+ 5.8	92.9	93.7	+ 0.9
Automobiles	1.948	2.102	+ 7.9	114.1	119.7	+ 4.9
Aircraft	1.777	1.910	+ 7.5	N.A.	N.A.	N.A.
Aircraft Engines & Parts	1.911	2.014	+ 5.4	N.A.	N.A.	N.A.
Ship & Boat Building & Repairing	1.788	1.920	+ 7.4	N.A.	N.A.	N.A.
Locomotives & Parts	1.963	1.935	— 1.4	N.A.	N.A.	N.A.
Railroads & Street Cars	1.810	1.827	+ 9.4	N.A.	N.A.	N.A.

N.A. — Not available.

SOURCE: U.S BUREAU OF LABOR STATISTICS

METALWORKING EXPORTS SHOW HEALTHY GAIN

Foreign trade	MILLION DOLLARS 1951	1952	PERCENT CHANGES 1951 TO 1952
Total machinery and vehicles	$4,671.0	$5,104.6	+11.7
Electrical machinery and apparatus**	551.9	605.8	+ 9.8
Generators	64.9	90.1	+38.8
Transforming or converting apparatus	25.7	33.7	+31.1
Transmission and distributing apparatus	36.7	55.2	+50.4
Motors, starters, controllers	47.5	57.9	+21.9
Household electric refrigerators	70.6	74.9	+ 6.1
Radio apparatus**	93.6	71.2	−23.9
Engines, turbines and parts	196.6	158.4	−19.4
Construction and conveying machinery	259.3	323.5	+24.8
Mining machinery	67.8	65.3	− 3.6
Petroleum field and refining equipment	85.1	90.9	+ 6.8
Pumping machinery	42.9	45.9	+ 7.0
Metalworking machinery**	192.4	254.3	+32.2
Machine tools and parts**	73.0	122.2	+67.3
Other metalworking machinery	119.4	132.1	+10.6
Textile, sewing and shoe machinery	144.1	110.9	−23.0
Other industrial machinery	375.0	530.1	+41.4
Office appliances	119.6	89.8	−24.9
Printing and bookbinding machinery	35.8	27.7	−22.6
Agricultural machinery and parts	140.7	154.2	+ 9.6
Tractors, parts and accessories**	310.2	313.4	+ 1.0
Automobiles, parts and accessories**	1,187.6	1,040.9	−12.3
Motor trucks, and buses chassis, new	387.2	324.1	−16.2
Passenger cars and chassis, new	340.0	262.5	−22.7
Aircraft parts and accessories	19.1	26.7	+39.8
Other vehicles and parts**	77.0	137.2	+78.1
Merchant vessels	29.6	49.2	+66.2
Freight cars	4.4	4.8	+ 9.1
Special category items	785.5	1,142.2	+45.4

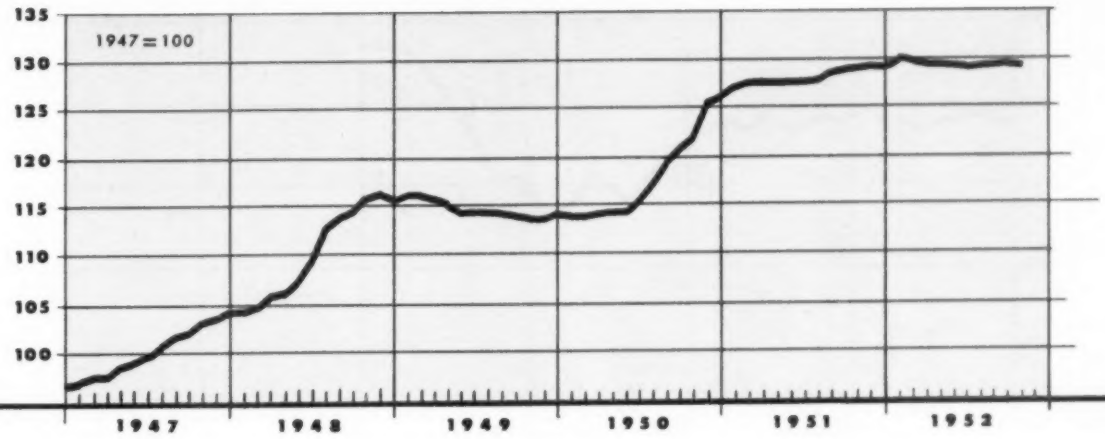
Thanks to shipments of military equipment and of machinery needed for Nato defense purposes, the dollar volume of exports of metalworking goods rose 12% in 1952 compared with the previous year. Machinery and vehicles sent abroad added up to more than $5 billion.

It is likely, however, that 1953 will tell a different story. Foreign aid seems destined to be chopped as an Eisenhower economy measure. It thus is improbable that dollar exports this year will be as high as in '52. One should remember, though, that government departments still have on hand considerable money to spend for equipment for overseas markets. Canada has been the biggest buyer of U.S. metalworking goods.

CANADA IS NO. 1 BUYER OF U.S. METALWORKING GOODS

RANK	MILLION DOLLARS
1. CANADA	$1,065
2. BRAZIL	420
3. MEXICO	300
4. VENEZUELA	205
5. CUBA	160
6. UNITED KINGDOM	135
7. FRANCE	115
8. AUSTRALIA	110
9. UNION OF S. AFRICA	103
10. COLOMBIA	100

AMERICAN MACHINIST PRICE INDEX STAYS STEADY



AMERICAN MACHINIST METALWORKING PRICE INDEX

	1947	1948	1949	1950	1951	1952		1947	1948	1949	1950	1951	1952
JAN.	97.1	104.0	115.6	114.1	126.7	129.2	JUL.	99.6	109.4	114.6	115.4	127.8	129.4
FEB.	97.5	104.3	116.0	114.1	127.1	130.0	AUG.	100.7	112.5	114.3	117.4	127.8	129.6
MAR.	97.7	104.9	116.0	114.1	127.8	129.8	SEP.	102.0	114.0	114.2	119.2	128.2	129.6
APR.	97.9	106.1	115.4	114.3	127.8	129.7	OCT.	102.6	114.8	114.1	121.0	128.7	129.5
MAY	98.8	106.2	115.0	114.5	127.8	129.7	NOV.	103.1	115.2	113.9	122.1	128.9	129.5p
JUN.	99.2	107.6	114.6	114.7	127.8	129.4	DEC.	103.6	116.6	113.9	125.3	129.1	

PRICE INDEX COMPONENTS

METALWORKING MACHINERY

	1947	1948	1949	1950	1951	1952
JAN.	96.7	104.9	112.1	113.7	133.8	136.2
FEB.	97.1	105.1	112.8	113.7	133.8	136.8
MAR.	97.3	105.2	112.8	114.1	133.8	136.6
APR.	97.8	105.3	112.9	115.6	133.8	136.6
MAY	99.0	105.4	112.9	115.8	133.7	136.7
JUN.	99.4	105.5	112.9	116.2	133.2	136.6
JUL.	100.2	106.6	113.0	117.6	133.2	137.8
AUG.	101.4	108.5	112.9	121.2	133.5	137.9
SEP.	101.7	110.5	112.8	123.0	134.2	138.0
OCT.	102.6	111.0	112.7	124.6	135.3	138.0p
NOV.	103.4	111.5	112.7	127.4	136.7	
DEC.	103.8	111.9	112.7	131.8	137.2	

FABRICATED METAL PRODUCTS

	1947	1948	1949	1950	1951	1952
JAN.	97.5	103.8	116.7	115.1	123.1	126.7
FEB.	97.7	104.1	117.2	115.1	123.4	128.2
MAR.	98.1	105.0	117.2	115.1	124.8	128.1
APR.	98.1	107.1	116.6	115.2	124.8	127.9
MAY	98.3	107.1	116.1	115.3	124.8	127.9
JUN.	98.5	109.2	115.6	115.3	124.8	127.8
JUL.	98.9	110.9	115.8	115.7	124.8	127.8
AUG.	100.7	114.5	115.3	116.3	124.8	128.0
SEP.	102.3	115.6	115.1	117.9	125.3	128.0
OCT.	102.9	116.1	114.9	119.6	126.2	128.0p
NOV.	103.1	116.3	114.7	120.3	126.3	
DEC.	103.4	116.8	114.7	122.3	126.6	

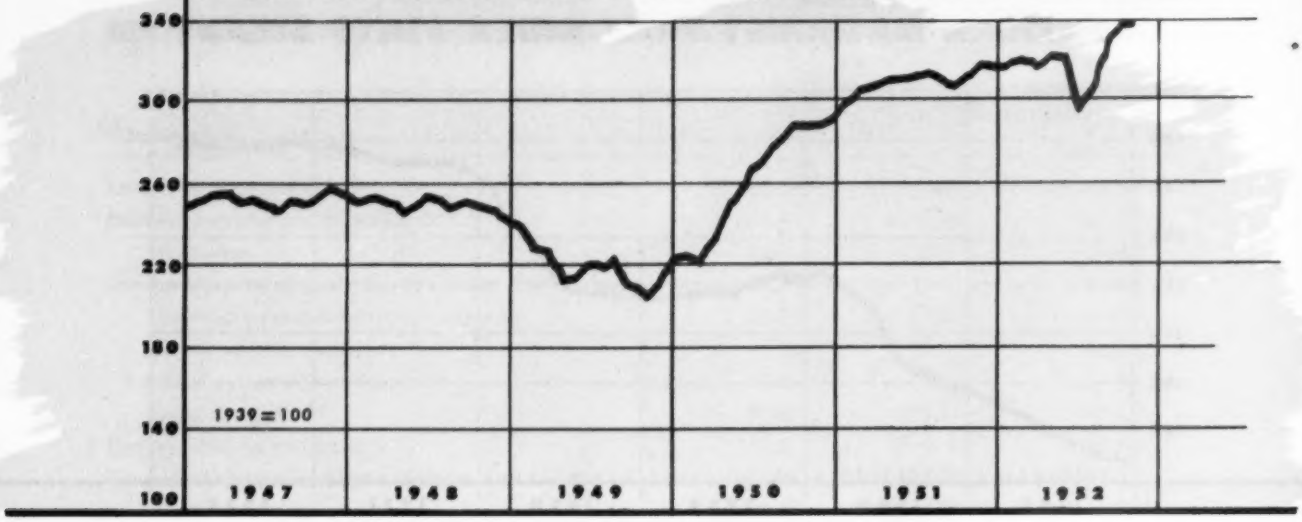
OTHER MACHINERY EXCEPT ELECTRICAL

	1947	1948	1949	1950	1951	1952
JAN.	97.3	104.9	116.2	115.4	131.4	132.8
FEB.	97.8	105.2	116.4	115.6	132.1	132.9
MAR.	97.9	105.7	116.3	115.6	132.1	132.5
APR.	98.1	106.2	116.2	115.9	132.1	132.5
MAY	98.7	106.5	116.0	116.0	132.1	132.5
JUN.	99.4	107.3	116.0	116.1	132.1	132.2
JUL.	99.7	109.1	115.9	116.9	132.2	132.2
AUG.	100.1	111.6	115.8	119.7	132.1	132.2
SEP.	101.2	114.0	115.8	122.0	132.2	132.2
OCT.	102.1	115.3	115.7	123.4	132.3	132.1p
NOV.	103.2	116.0	115.6	125.0	132.4	
DEC.	104.1	116.2	115.5	129.4	132.5	

ELECTRICAL MACHINERY

	1947	1948	1949	1950	1951	1952
JAN.	94.9	102.0	110.5	105.2	126.6	126.5
FEB.	95.3	101.8	110.9	104.4	126.8	126.6
MAR.	95.6	101.8	110.8	104.8	126.7	126.5
APR.	96.7	101.6	108.9	104.6	126.8	125.9
MAY	101.6	101.3	107.4	104.7	126.8	125.8
JUN.	102.2	101.6	106.3	106.3	126.8	124.9
JUL.	102.1	104.0	105.9	108.3	127.2	123.9
AUG.	102.3	107.4	105.8	113.5	127.1	124.7
SEP.	102.5	108.5	105.8	115.2	127.1	124.6
OCT.	102.4	108.7	105.8	118.8	126.8	124.1
NOV.	102.4	109.3	105.8	119.2	127.1	
DEC.	102.5	109.9	105.8	124.8	126.8	

AMERICAN MACHINIST PRODUCTION INDEX AT PEAK



AMERICAN MACHINIST INDEX OF METALWORKING PRODUCTION

	1947	1948	1949	1950	1951	1952		1947	1948	1949	1950	1951	1952
JAN	248	255	240	221	288	315	JUL	247	253	220	266	311	293
FEB	250	249	236	221	297	319	AUG	244	252	218	274	312	303
MAR	252	252	227	220	303	320	SEP	250	248	222	279	308	330
APR	253	250	222	231	307	318	OCT	250	250	214	285	306	338
MAY	249	245	215	248	309	321	NOV	251	249	204	285	311	338p
JUN	252	247	216	255	310	320	DEC	257	245	210	285	318	

COMPONENTS OF AMERICAN MACHINIST INDEX

MACHINERY	1947	1948	1949	1950	1951	1952		1947	1948	1949	1950	1951	1952
JAN	263	273	245	199	285	307	JUL	264	273	203	244	310	296
FEB	264	271	239	208	293	322	AUG	263	272	199	251	304	298
MAR	265	272	230	213	295	322	SEP	265	267	199	249	302	303
APR	270	267	220	223	299	318	OCT	265	265	199	261	306	308p
MAY	268	269	211	230	302	317	NOV	265	263	187	266	309	
JUN	265	272	204	234	304	316	DEC	269	258	194	270	320	

ELECTRICAL MACHINERY	1947	1948	1949	1950	1951	1952		1947	1948	1949	1950	1951	1952
JAN	271	264	245	246	327	362	JUL	268	255	228	303	342	332
FEB	271	262	246	252	333	367	AUG	264	256	229	321	351	354
MAR	273	258	244	258	341	358	SEP	266	252	237	323	345	383
APR	268	260	240	278	353	350	OCT	266	249	241	333	348	398p
MAY	268	258	240	292	358	349	NOV	264	247	233	333	356	
JUN	269	255	229	289	351	349	DEC	265	241	238	333	362	

OTHER TRANSPORTATION	1947	1948	1949	1950	1951	1952		1947	1948	1949	1950	1951	1952
JAN	288	281	261	208	313	494	JUL	274	285	260	250	433	538
FEB	287	275	259	214	337	504	AUG	273	287	238	279	454	551
MAR	285	279	252	210	350	512	SEP	272	286	248	288	457	550
APR	294	281	243	212	362	503	OCT	272	286	231	273	440	570p
MAY	292	268	244	221	373	526	NOV	271	285	229	277	478	
JUN	291	269	242	225	389	538	DEC	281	279	216	280	489	

AUTOS & TRUCKS	1947	1948	1949	1950	1951	1952		1947	1948	1949	1950	1951	1952
JAN	179	199	203	218	241	217	JUL	177	195	209	254	219	162
FEB	184	177	197	188	251	212	AUG	174	189	210	264	226	172
MAR	188	195	187	195	259	214	SEP	189	187	216	258	224	242
APR	187	191	193	205	249	226	OCT	190	199	203	264	217	248p
MAY	173	173	173	241	245	230	NOV	195	198	176	258	216	
JUN	184	180	198	260	235	228	DEC	208	203	185	255	219	

OTHER METALWORKING	1947	1948	1949	1950	1951	1952		1947	1948	1949	1950	1951	1952
JAN	273	276	251	234	300	312	JUL	271	273	233	286	317	287
FEB	275	274	247	239	299	314	AUG	269	276	235	303	313	302
MAR	276	272	237	242	314	314	SEP	275	269	239	307	308	325
APR	278	270	230	251	320	309	OCT	273	270	229	308	308	331p
MAY	276	270	228	261	321	311	NOV	274	269	223	305	307	
JUN	277	269	231	279	323	306	DEC	279	263	232	307	316	

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1953

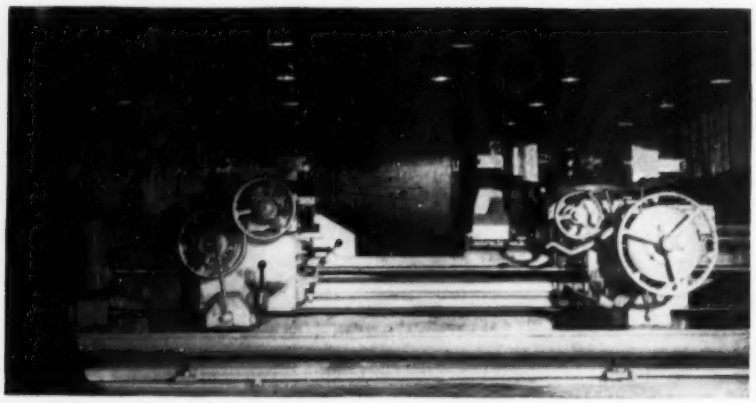
American Machinist

Production Preview

the 40th annual review of new metalworking equipment, parts, and materials. these items were described in the pages of American Machinist during 1952...

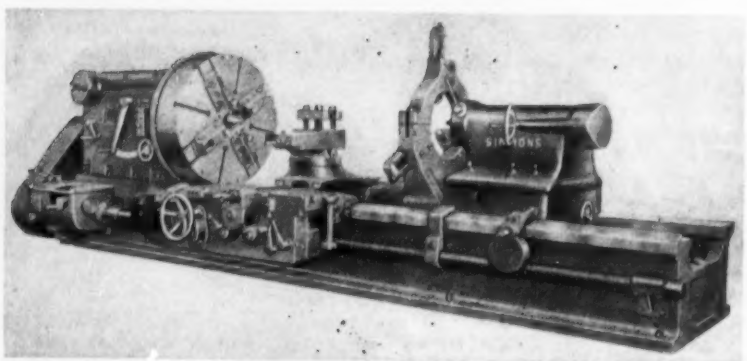
1953 American Machinist Production Preview

TURNING



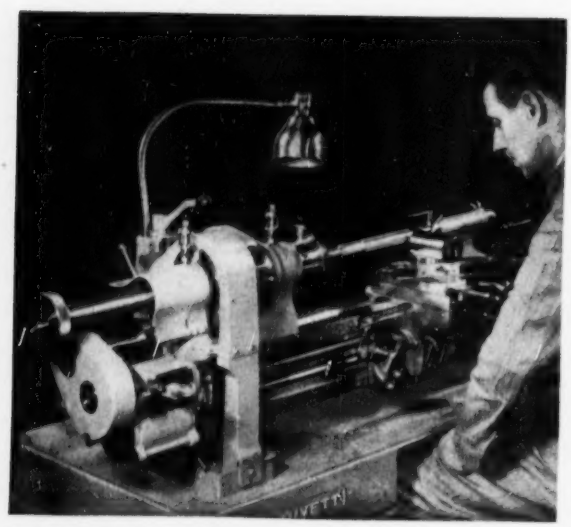
GAP LATHE—*Warner & Swasey Co, 5700 Carnegie Ave, Cleveland 3, Ohio.* Designed to machine large jet engine exhaust cones operates with a single setup to machine flanges at both ends. Cutting tools turn and form flanges to exact dimensions in one pass, an advantage over vertical turret lathes requiring two setups and a tool change.

AUTOMATIC LATHE—*R K LeBlond Machine Tool Co, Cincinnati Ohio.* No. 1 automatic contour facing lathe can profile face compressor disks used in the various jet engines. Two headstocks are offered—the high-speed head for aluminum disks at the cold end of the engine—the other for stainless-steel and titanium disks.

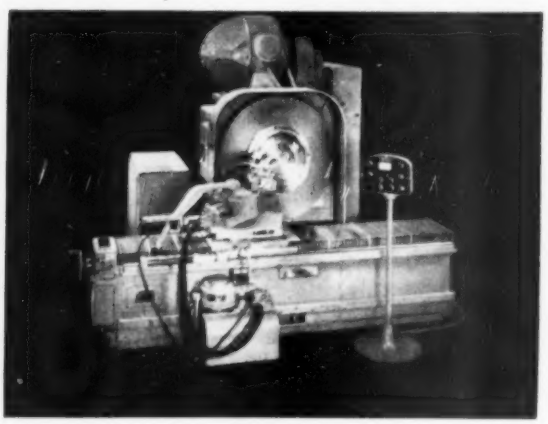


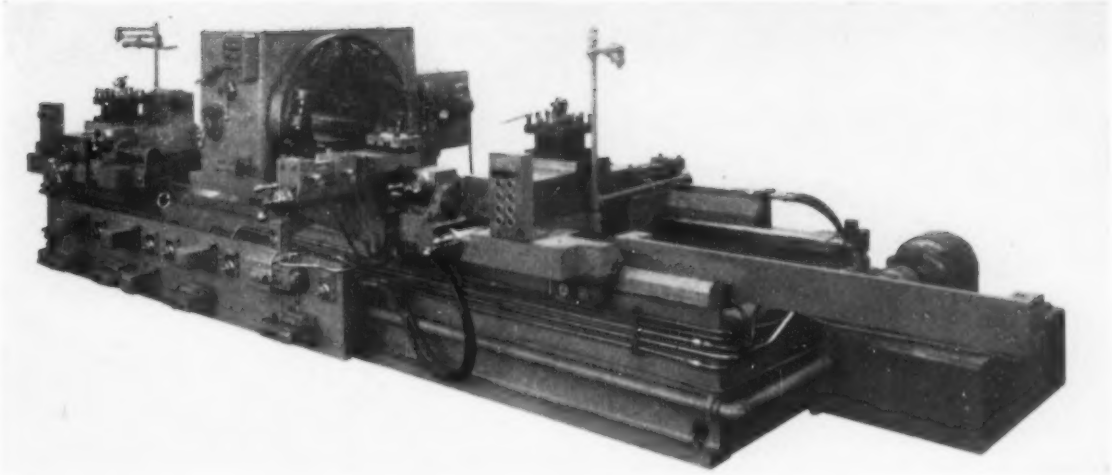
ENGINE LATHE—*Simmons Machine Tool Corp, Albany 1, NY.* This redesign of the Simmons 48-in. engine lathe is intended primarily for ordnance plants, shipyards, and other shops having heavy turning, facing, and threading operations. Bed lengths run from 20 ft to any required length in 5-ft increments. Bed has an angular guide front way with a continuous flange for rigidity. Width of bed is 46½ in.

RIGHT-ANGLE LATHES—*Monarch Machine Tool Co, Sidney, Ohio.* Two tracer-controlled, right-angle lathes have been developed by Monarch for the fast, accurate machining of jet-engine rings, vanes, disks, wheels, and other components. They are equipped with right and left power angular slides and Air Gage tracer units for contouring operations on outside diameters, or faces. Swing in gap is 60 in. and maximum turn dia is 48 in.

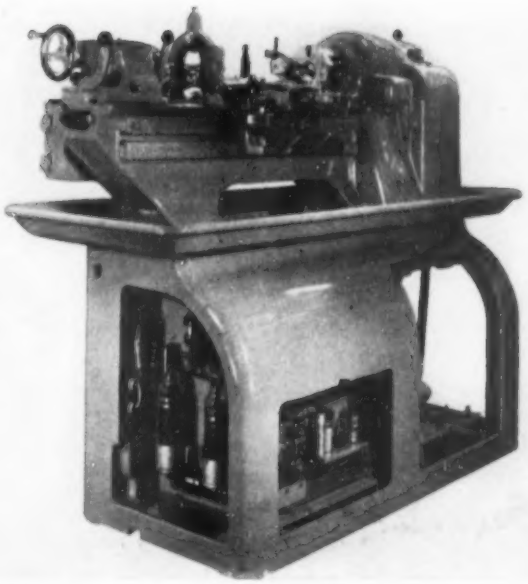


INSTRUMENT LATHE—*Rivett Lathe & Grinder, Inc, Brighton 35 Boston, Mass.* This 8½-in. swing instrument lathe is guaranteed to turn a bore within 0.0001 in. in six inches. Work is held in collet or between centers.

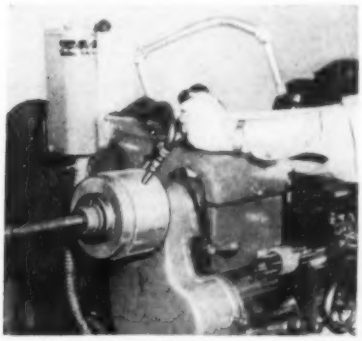




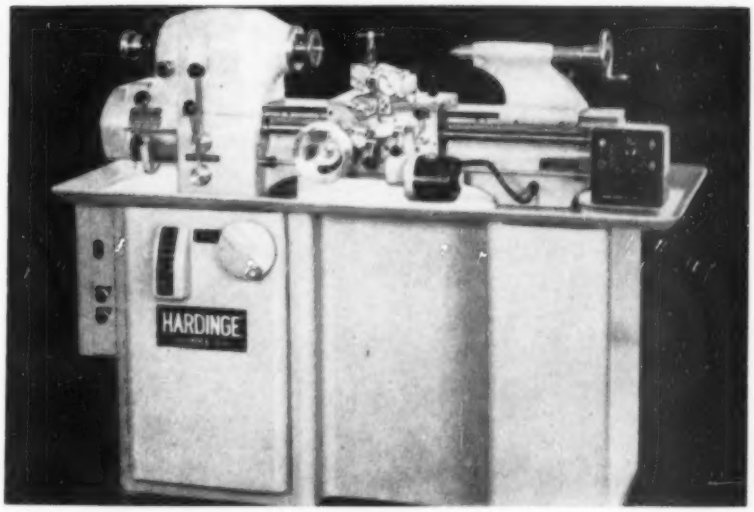
HOLLOW-SPINDLE LATHE — *Lehmann Machine Co, St Louis, Mo.* With 42-in. swing bores, faces, and turns (at one setting) turbine-frame assemblies for jet engines. It maintains dimensional accuracy and relative concentricities and squareness of surfaces difficult to secure when the work has to be reset. Total of 16 surfaces are machined, 8 facing, 5 turning, and 3 boring. Longitudinal feeds are hydraulic with automatic stops. There are 6 spindle speeds from 21 to 100 rpm.



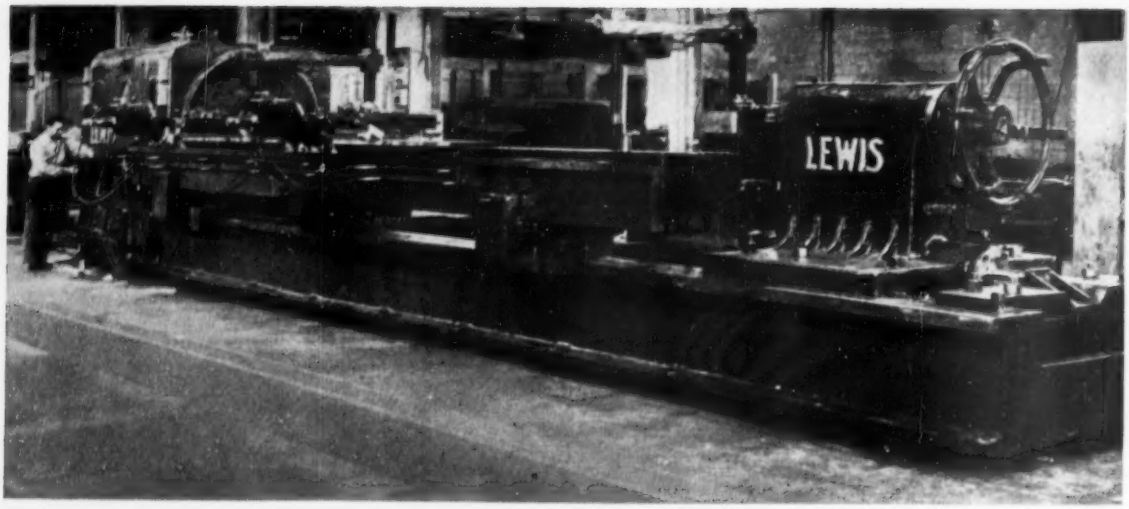
TOOLMAKER'S LATHE—*Hendey Machine Co, Torrington, Conn.* Electronic drive for the 9x24-in. tool and gagemaker's lathe fits into the base as an optional control for the 3-hp dc adjustable-speed motor. It provides a stepless speed range from 25 to 3000 rpm by potentiometer control of both field and armature of the motor.

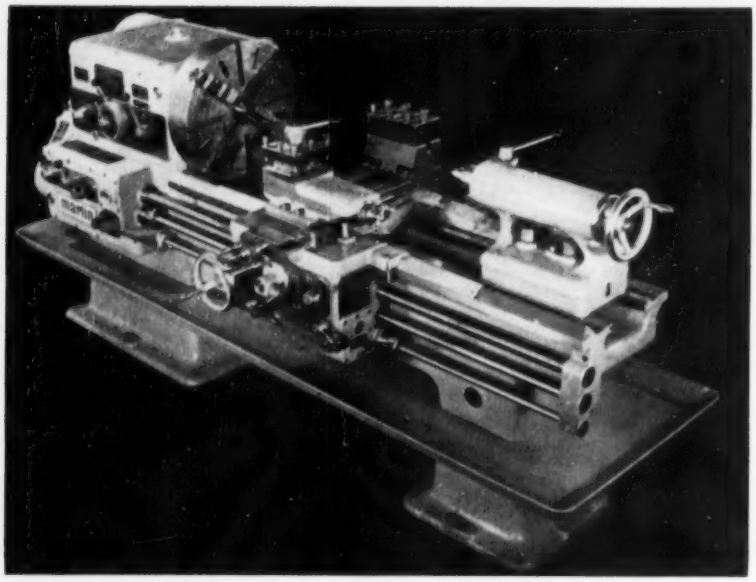


PNEUMATIC COLLET-CLOSER — *Williams Metal Products, 3713 South Robertson Blvd, Culver City, Cal.* Flick of the valve positions the work. Feeding and releasing of bar stock through the spindle can be done without stopping the machine. Unit is adaptable to both production and toolroom operation of turret lathes, automatic screw machines, and other machines of ½- or 1-in. capacity.



TOOLROOM LATHE—*Hardinge Bros, Inc, Elmira, NY.* Model HLV lathe fills the gap between the plain precision bench lathe and the heavy-duty engine lathe weighing one or two tons. An independent variable feed for carriage and cross-slide, for the headstock spindle in the range of 125 to 3000 rpm.



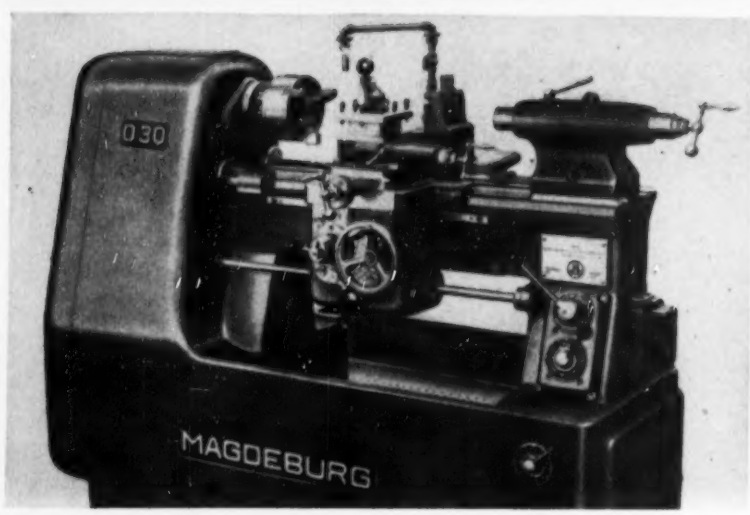


HYDRAULIC LATHE—*Lewis Foundry & Machine Div, Blaw-Knox Co, Pittsburgh Pa.* This 60-in. unit for machining steel rolls, has a 60-hp main drive motor with variable speed from 300 to 1200 rpm. Separate motor is provided for the hydraulic pumps which maintain a pressure of 1000 lb in each of the cylinders. Hydraulic pressure controls the infeed of the tool, the traverse of the tool, and the movement of the tailstock.

←

ENGINE LATHE—*Transmares Corp, 15 William St, New York 5, N Y.* Precision lathe made by K Martin Offenburg, Germany, swings 20 in. above the bed and 30 in. above the 10-in. gap. "Raised-in-the-sand" head and tailstock castings can be supplied on one model to raise the swing to 28 in. Known as the DL-500, it comes in lengths from 8 to 18 ft, has a speed range of 22 to 1000 rpm, and is equipped with a main spindle running on roller bearings.

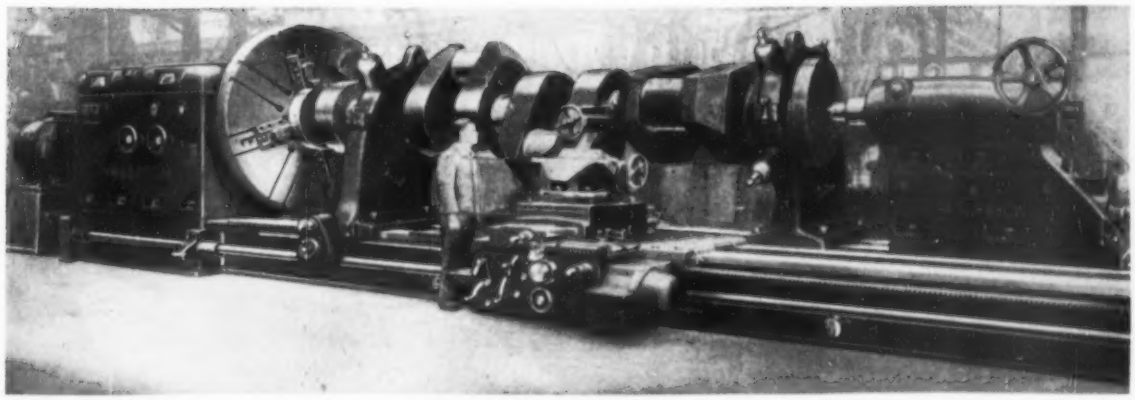
LATHES—*Transmares Corp, 15 William St, New York 5, NY.* There are two models of these Weiler (German-made) brass finisher's lathes, and two models of engine lathes. The Model LZ 280 engine lathe is provided with a quick-change gear box and power cross feed.



FLASH LATHE—*J M Nash Co, 2360 N 30th St, Milwaukee 45, Wis.* Ten-spindle automatic flash lathe handles various finishing operations on circular plastic moldings, and secondary operations on small circular metal parts. Spindles having a variable rate of from 700 to 2000 rpm. Capacity is diameters up to 4½ in. with heights to 8 in.

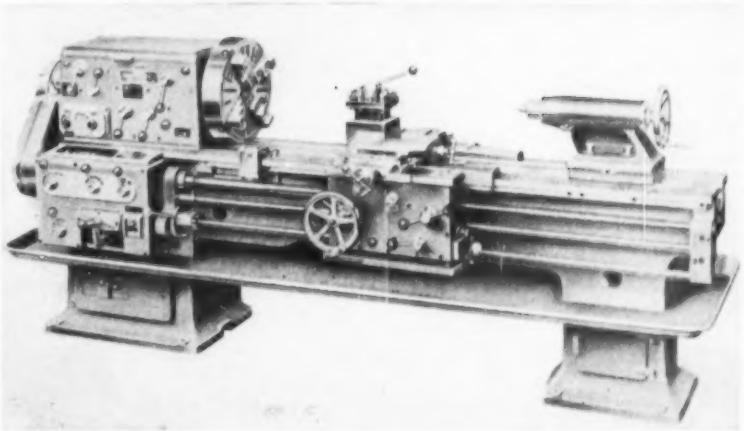
←

LATHE—*Kurt Orban Co, Inc, 21 W 42nd St, New York 6, N Y.* Simpler in design and having fewer parts than most lathes, the Magdeburg (German) Type D-30 lathe is for both super-finishing work and volume runs. Speeds range from 300 to 3000 rpm. Steel with tensile strengths up to 110,000 psi can be cut to a depth of 0.158 in., or a dia of 0.316 in. with a feed of .004 in.



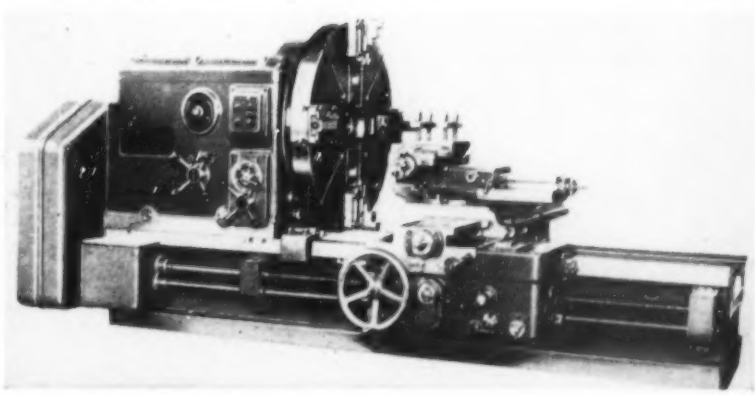
LATHE—*Kearny Mfg Co Inc, Kearny, N J.* Spindle head on the Waldrich Siegen (German) high-speed lathe has a forged main spindle on friction bearing. Speed changes are affected by sliding gears. The drive is either an induction motor with 16 gearing steps or variable-speed dc motor and additional 4-gearing steps with the same total speed range.

TWIN-SLIDE CARRIAGE LATHE—*M B I Export & Import Ltd, 475 Grand Concourse, Bronx 51, N Y* Features of this Schaerer (German) lathe include: All gears in headstock hardened and ground; quick-change gear and carriage equipped with a Bosch one-shot oiling system; cross-slide has a ball-stop catch for accurate adjustment of depth in screw-cutting job, taper-turning attachment carries a micrometer dial which makes it possible to adjust to a fraction of a degree.



ENGINE LATHE — *Guthery Machine Tool Corp, 130 W 42nd St, New York 36, N Y.* Engine lathe made by Weisser Heilbronn (German) has 36 spindle speeds and a rigid, sturdy construction. Conventional hexagon spline shafts replaced by triangle-profile shafts. Distance between centers are 40, 60, 80, 100, 120 in., Maximum swing over bed is 19½ in., with max. swing over gap of 28⅝-23⅝ in.

HYDRAULIC COPYING ATACHMENT—*Morey Machinery Co, Inc, 410 Broome St, New York 13, N Y.* Swiss hydraulic copying attachment, known as the Bondycop, can convert almost any lathe into an automatic tracer-controlled machine. It will copy angles of 90° in the direction of the headstock, up to 6 in.

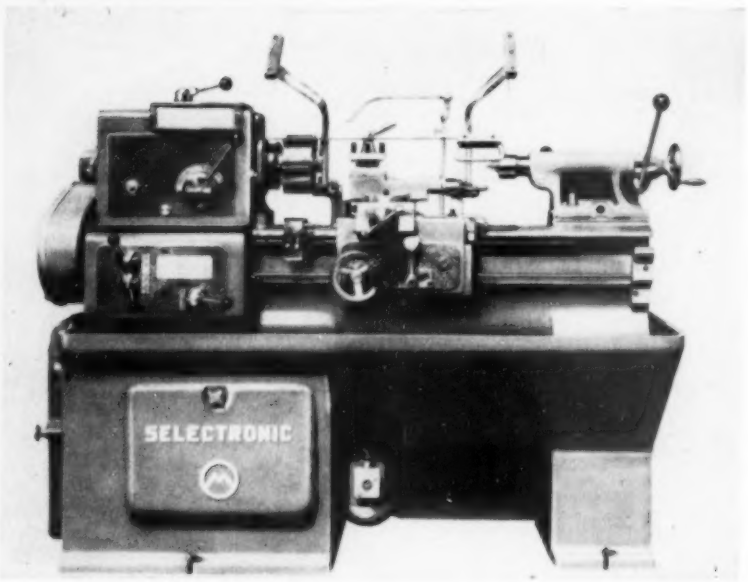


COPYING LATHE — *Cosa Corp, 405 Lexington Ave, New York 17, N Y.* The Sensitast copying lathe will make 90° cuts on the left or right side of the work. It can copy practically any outside or inside form. Swing is 17 in. over cross slide 28 in. over saddle, and 37 in. over bed cover. Distance between center is 39 in.

FACING LATHE — *Kelvin Systems Corp, 135 Front St, New York 5, N Y.* Distance between centers: 49-3/16, 88-9/16, 127-15/16, 167-5/16. Maximum swing over bed is 51-3/16 in. Stopping and reversing is carried out by means of a clutch which is operated electromechanically. There are three remote-control servo motors for clutch control and a transformer for supplying 120 v to the remote-control-switch coils. Imported from Italy.

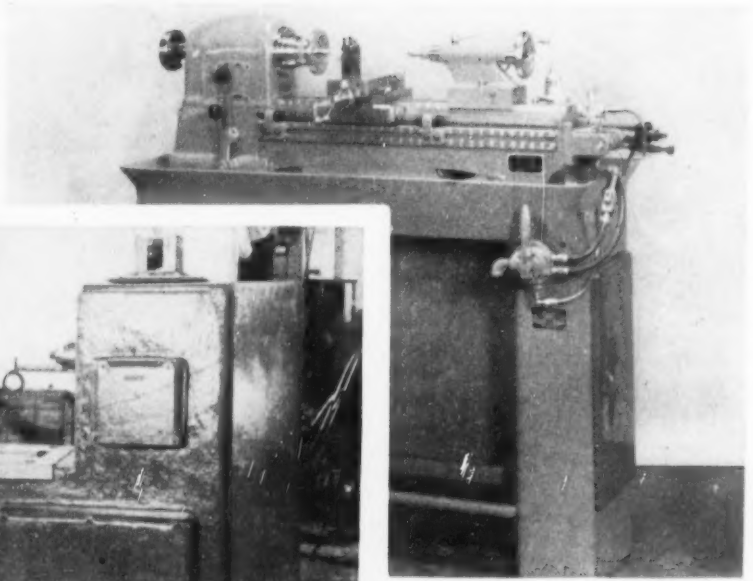
TOOLROOM LATHE — *Logan Engineering Co, Chicago 30, Ill.* The 1100-series lathe has an extra-large headstock spindle turning on a double and a single row of ball bearings. Swing is 11 in. and collet capacity 1 in. A draw-bar collet attachment is built in and supplied as standard equipment.

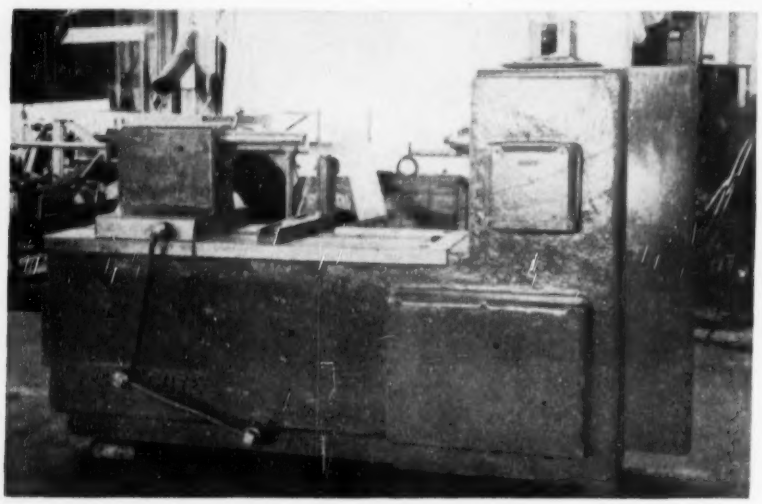
LATHE—*Morey Machinery Co, Inc, 410 Broome St, NY.* Small turning work is handled at high speed on an engine lathe with "Selectronic" headstock control. Distance between centers is 22¼ in., swing is 13¾ in., motor has 6.4 hp at 1500 rpm. ↓



LATHES—*Clausing Div, Atlas Press Co, 2304 N Pitcher St, Kalamazoo, Mich.* Atlas Press recently purchased the Clausing Mfg Co, producers of heavy-duty 12-in. precision lathes. Several refinements of design and construction have been incorporated in the two series of lathes. Specifications for both lathes: 24, 36, and 48 in. between centers; 12¾-in. swing over bed, 7½ in. over saddle.

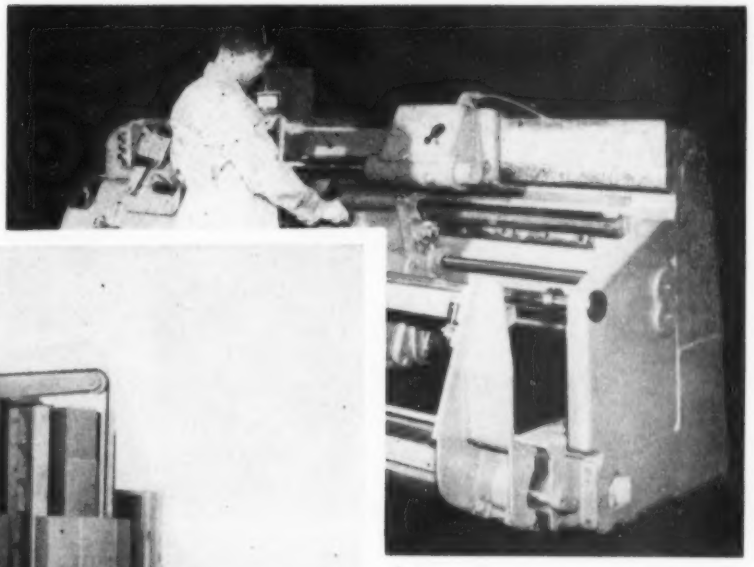
SPINNING LATHE — *Ferracute Machine Co, Bridgeton, N J.* Model 224 spinning lathe saves production time in such standard operations as spinning, buffing, burnishing, trimming, wiring, and beading. A 5-hp motor is standard. Low motor speed permits infinite selection between 200 and 500 rpm. The high motor speed is infinitely adjustable between 400 and 1000 rpm. ↓

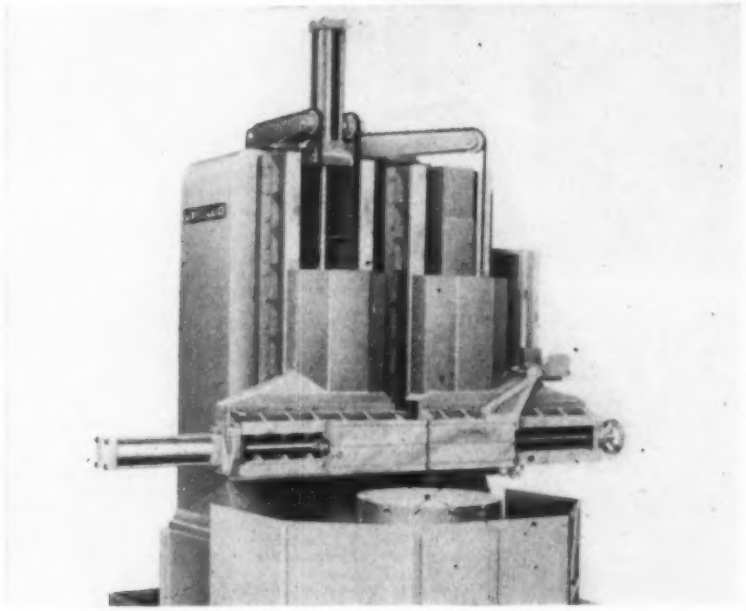




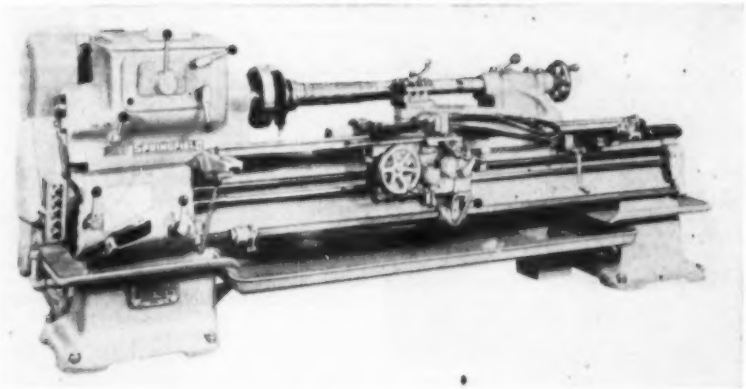
AIR-FEED LATHE — *Elgin Tool Works, 1770 Berteau Ave, Chicago 13, Ill.* Pneumatic longitudinal feed eliminates gears, leadscrew, worms, and splitnut on this precision lathe. Longitudinal feed is 12 in. spindle speeds are from 120 to 3900 rpm.

COPY LATHE—*The New Britain Machine Co, New Britain, Conn.* By getting away from conventional design, the GF copy lathe has four features: 1) simplicity of operation, 2) low setup and changeover time, 3) reduced handling and checking time, and 4) elimination of expensive form tools and multi-tool blocks. Cutting is done from underneath the work and the chips drop straight down to the pan.





VERTICAL CONTOURING MACHINE—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Style 426-A does precision contouring, boring, turning, facing, grooving and rabbeting on large round parts such as jet-engine compressor wheels. Simple controls and automatic functions make it possible for an unskilled operator to do accurate production work. Tracer carried on the horizontal member of the right-hand compound slide controls both vertical and horizontal movements.



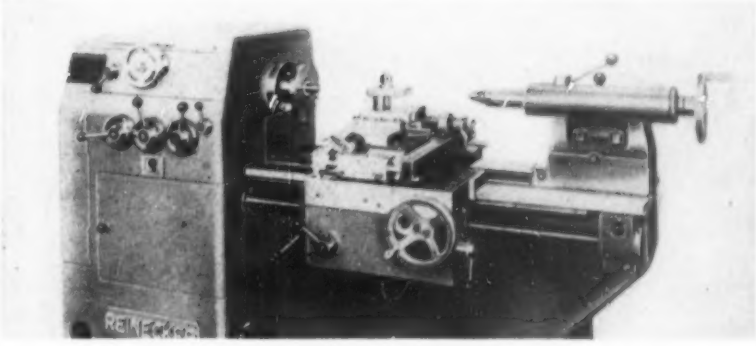
COPYING ATTACHMENT — *Marton Equipment, Inc, 4, Essex St, Beverly, Mass.* Hydraulic copying attachment for application to standard lathes consists of three parts: the copying slide assembly which mounts on the rear of the cross-slides; a templet or circular master carried on a holder at the rear of the bed, and a pump unit.

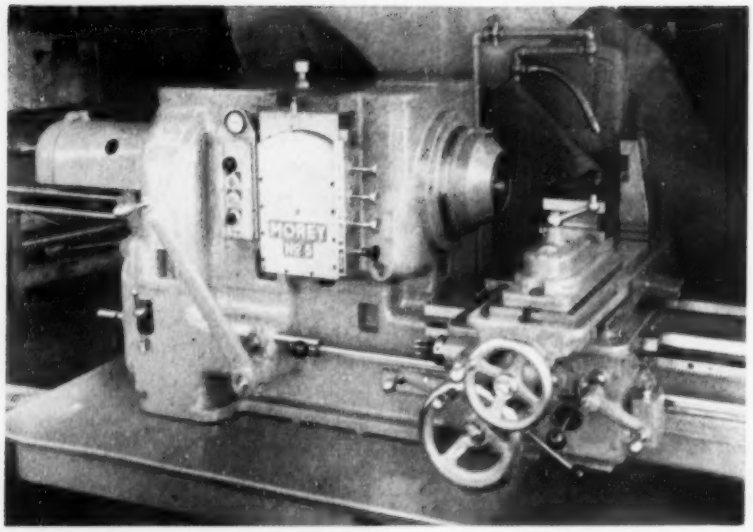
DRIVE—*Viking Industries, Rockford, Ill.* Attachment is designed for lathes with 6-station ram turrets and with bar capacity to 2½ in. It provides a continuous or interrupted cycle to speed short- or long-run work.

RELIEVING LATHE—*Kurt Orban Co, Inc, 205 E 42nd St, NY., NY.* Three groups of change gears are completely independent in the headstock of a Reinecker lathe built for back-up turning. Tool compound movements are independent of each other.

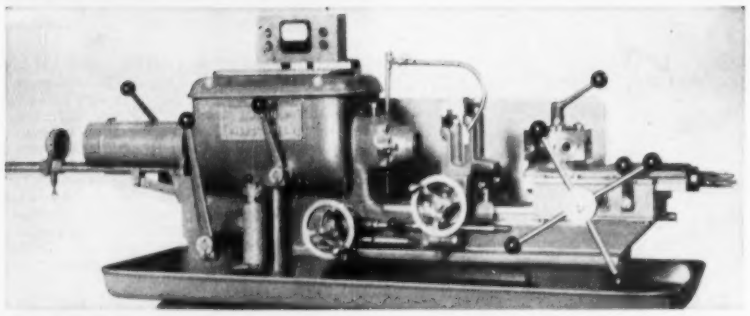
CONTOURING ATTACHMENT — *Springfield Machine Tool Co, Springfield, Ohio.* A motor-driven hydraulic pump, relief valve, and oil reservoir are a single, self-contained power unit which supply hydraulic pressure to the servo-valve and universal hydraulic compound rest. A supported and guided adjustable templet holder places templets at the front of the lathe.

DEBURRING—*Pines Engineering Co, Inc, Aurora, Ill.* This bench end-finishing machine enables the operator to clamp and feed the work to the cutting tools with a single movement of a hand lever. The machine illustrated handles stock up to 2-in. dia, also has the capacity for handling single-point boring, light forming, and turning.



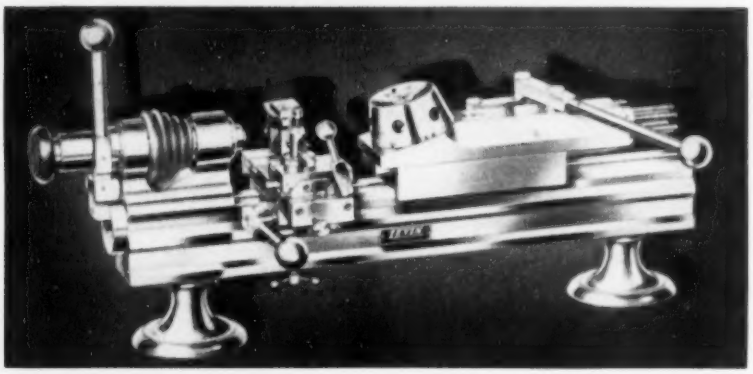


TURRET LATHE—*Morey Machinery Co, Inc, 410 Broome St, New York 13, N Y.* Instantaneous speed change made possible by a newly developed planetary drive, coupled with infinitely adjustable speeds from 32 to 1600 rpm. Planetary drive is designed around the spindle and is readily removed, intact, for maintenance by removing the front cover plate on the head-stock. Action is provided by hydraulic pressure.



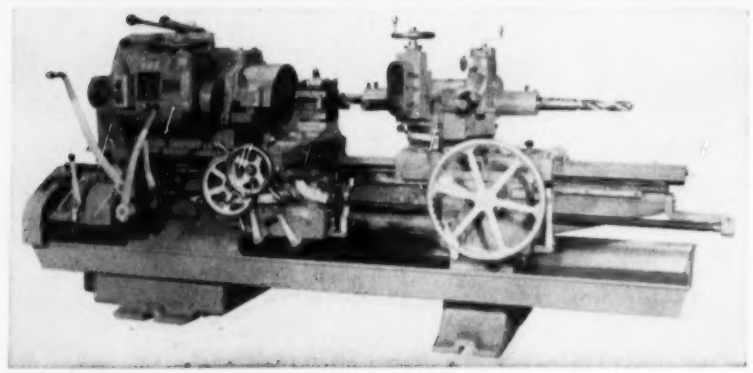
TURRET LATHE—*Eric R Bachmann, 27-11 41st Ave, Long Island City 1, NY.* The motor on this Kuhlman lathe (Germany) is of the two-speed type and can be instantly reversed by actuating a pedal. Twelve spindle speeds from 156 to 8000 rpm are available. The self-indexing turret has six stations with ⅝-in. bores.

TURRET LATHE—*Kurt Orban Co, Inc, 205 E 42nd St, New York 17, N Y.* The Hestika Model HR 26 turret lathe, made in Germany, has been designed throughout for accurate small-volume work rather than to handle mass production, and for that purpose uses a hand-operated feed. It has a bed length of 23½ in. and a maximum collet capacity of 1 in.



TURRET LATHE—*Simmons Machine Tool Corp, Albany 1, N Y.* No. 2 turret lathe utilizes standard assemblies and eliminates complex devices required only for rare operations. They are in plain or back-geared models. Automatic chuck capacities are: round bar, 1¼ in.; hex bar, 11/16 in.; square bar, ⅞ in.; hole in plunger, 19/32 in.

TURRET LATHE—*deCastro & Associates, 1515-17 Santa Fe Ave, Los Angeles 21, Calif.* The Hestika high-speed turret lathe has a threading attachment, compound cross-slide, 18 spindle speeds from 34 to 2400 rpm, and pressure-lubricated bearings.

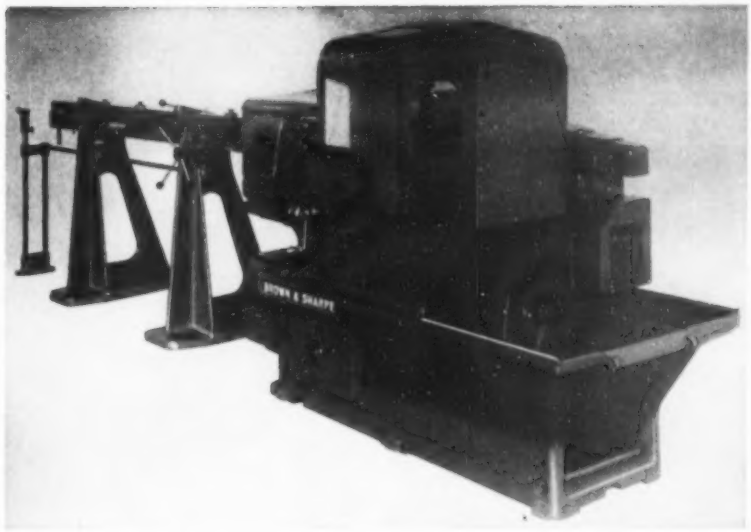


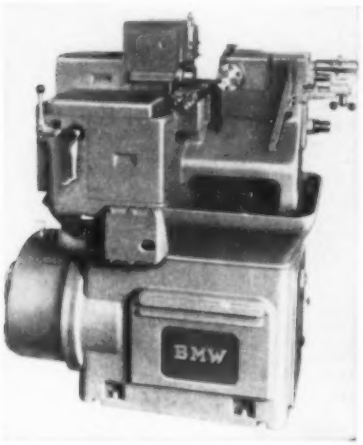
BENCH TURRET LATHE — *Louis Levin & Son, Inc, 782 E Pico Blvd, Los Angeles 21, Calif.* Small, sensitive bench turret lathe is made with two collet capacities, 3/16 or 5/16 in. Has a lever-operated collet closer, a double-tool cross-slide with a swivel compound slide, and a self-indexing, 6-position turret. The bed is 18 in. long.

TURRET LATHE—*Guthery Machine Tool Corp, 130 W 42nd St, New York 18, NY.* Length of Bed. 32½ in; Height of Centers, 4 in.; Maximum Collet Capacity, 19/32 in. The Model-ER15E turret lathe (Germany) has a sturdy sheet-steel base suitable for operation in a standing or sitting position.

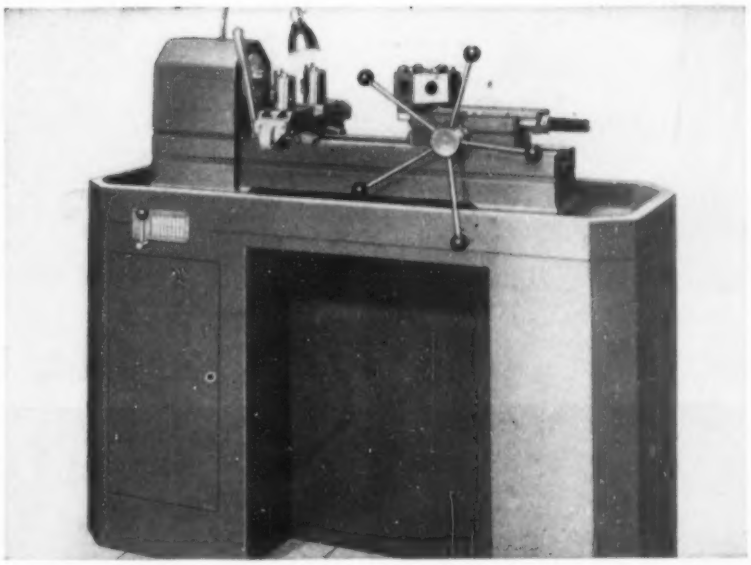
TURRET LATHES — *Pitnam Industrial Products Co, Div of Cement and General Development Corp, 608 Fifth Ave, New York 20, N Y.* The CMC (Canadian) No. 34½ turret lathe has a 4½ in. collet capacity and is said to embody standard American design. The headstock provides 12 spindle speeds and there are 16 longitudinal feeds to each carriage, ranging from 0.005 to 0.166 ipr and 16 cross feeds to the cross-slide carriage, ranging from 0.0025 to 0.083 in.

AUTOMATIC SCREW MACHINE — *Brown & Sharpe Mfg Co, Providence 1, R I.* The Brown & Sharpe No. 4 automatic is for medium-size work requiring close tolerance and good finish. A wide selection of speed ratios allows the right speed to be used for the particular job—threading, drilling, or forming. Capacity 1½ in dia. Max. turning length 5 in.



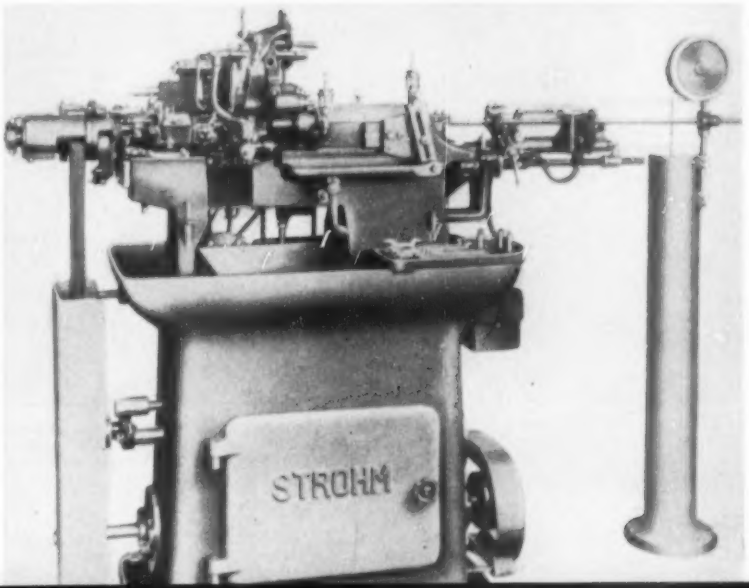


AUTOMATIC SCREW MACHINE — *Kurt Orban Co, Inc, 205 E 42nd St, New York 17, N Y.* Interchangeable cam assembly units that can be preselected and assembled for the next job, while one lot is still being run, reduce setup and downtime on German-built B M W single-spindle automatic screw machines.

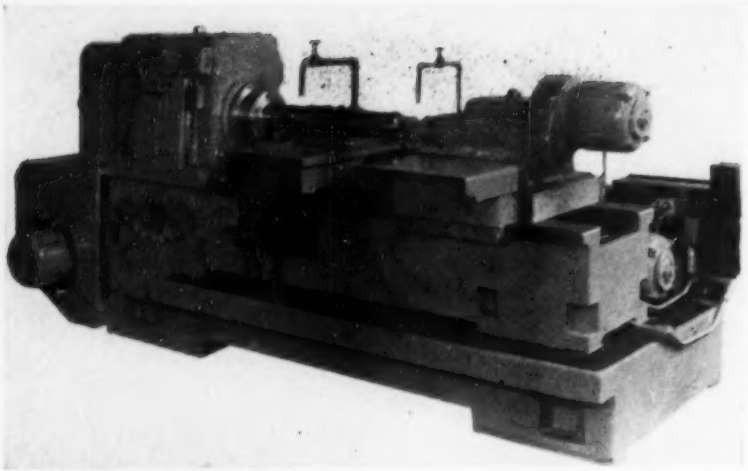


HAND SCREW MACHINE — *Globe Heat-Seal, Inc, Machine Tool Div, 3380 Robertson Blvd, Los Angeles 34, Calif.* Swing over bed is 10 in. and swing over cross-slide is 3¾ in. The Model-C hand screw machine is a high-speed machine, designed primarily for secondary operations. Through use of a 2-speed, reversible, 1-hp. 1800-900-rpm motor located in base of pedestal, 8 speeds are available without belt change, and 16 speeds with only one belt change.

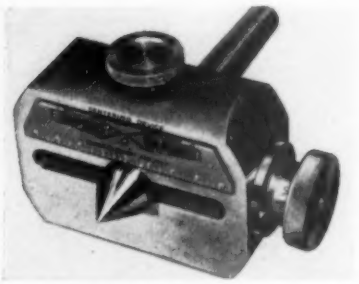
MULTI-TOOL HEAD — *General Roto Co, 8914 Melrose Ave, Los Angeles 46, Calif.* Roto Head has 8 different single-point tools mounted in slidable, spring-loaded toolholders. Head is mounted on a cross-slide dovetail, replacing the conventional cross-slide. It will fit any engine lathe between 9- and 12-in. swing. No center drilling of work is required, no tailstock support is needed. Work can be machined from full length bar stock to close tolerances, held to desired concentricity and cut-off in a simple series of crank rotations and manual longitudinal cuts.



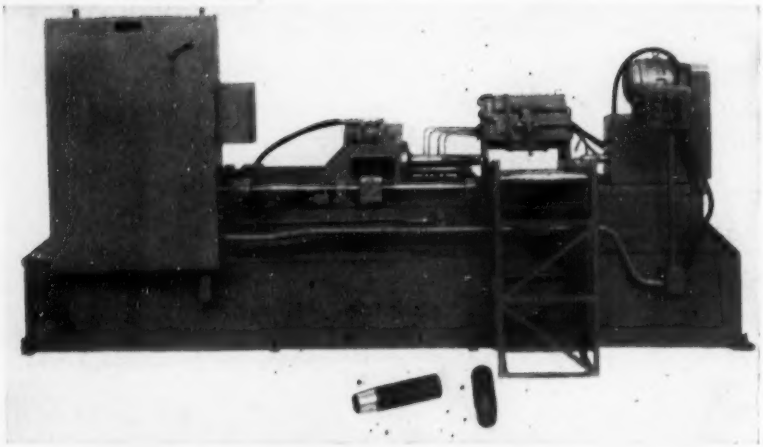
LONG-TURNING AUTOMATIC—*Kurt Orban Company, Inc, 205 E 42nd St, New York 17, N Y.* It handles thread lengths up to 1.378 in. and bore depths up to 1.575 in. Two models are available, differing in the sizes of bar stock handled. Type M75 takes up to 0.276 in. round, 0.197 in. square, 0.236 in. hex; M105 is for 0.394 in. round, 0.276 in. square, and 0.315 in. hex.



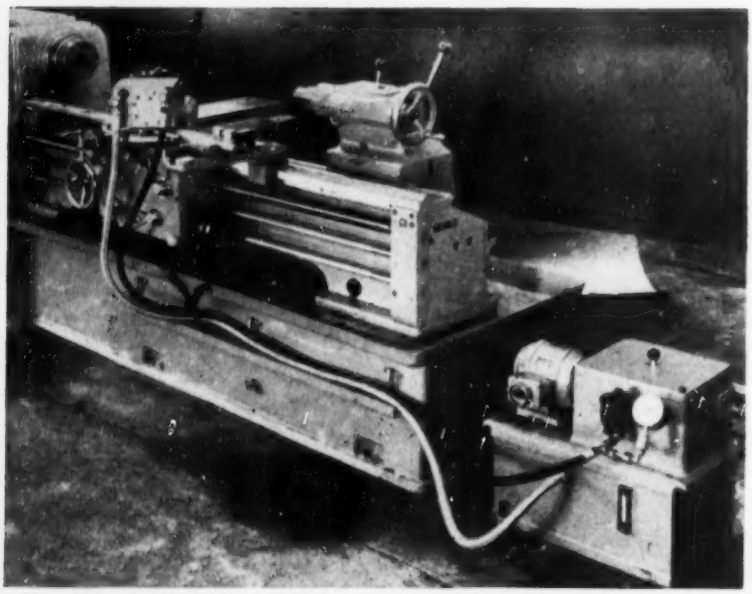
SHELL TURNING LATHE—*Made by Williams Tool Corp, Brantford, Canada, Represented by Four States Machinery Co, 5304 W Chicago Ave, Chicago 51, Ill.* For centering shell forging and cutting off open end; features heavy bed and headstock construction. Lathe is equipped with a self contained hydraulic automatic feed cycle.



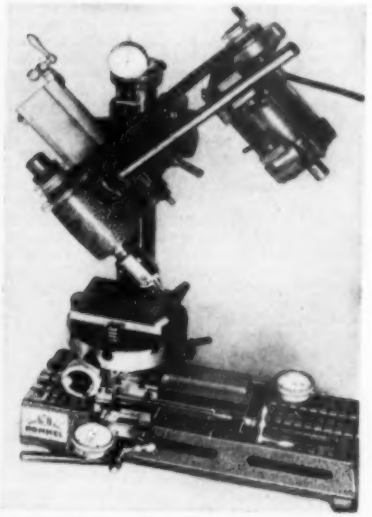
TAILSTOCK CENTERING DEVICE—*Master-Taper Co, 4531 N Beacon St, Chicago 40, Ill.* This lathe tailstock centering device and taper-turning attachment eliminates alignment of the tailstock center and turns tapers up to 3 in. per ft. Available in two sizes, one with a No. 2 Morse taper shank, and the other with a No. 3, 4, or 5.



SHELL CENTERING — *The Avey Drilling Machine Co, Cincinnati 1, Ohio.* Cycle of the Avey 105-mm shell centering machine is automatic from the time the forging enters the gravity chute until it rolls out onto a conveyor. Standard No. 2 cam feed unit with rapid traverse, feed, and rapid return is incorporated.



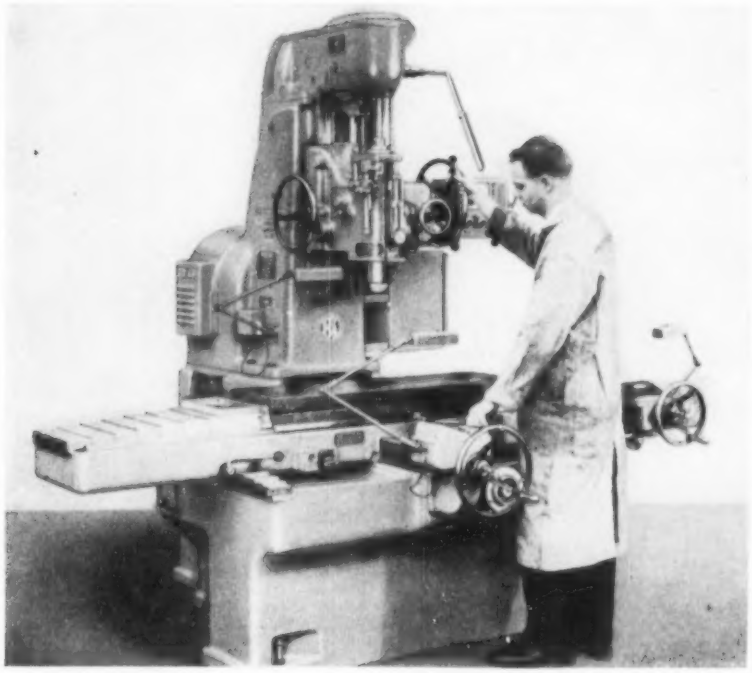
MULTICOP HYDRAULIC ATTACHMENT — *Guthery Machine Tool Corp, 130 W 42nd St, New York 36, N Y.* A German import, can be used on Weisser-Heilbronn lathes or any other make if dimensions are given. The attachment, master, and tracer are all on the front of the machine.

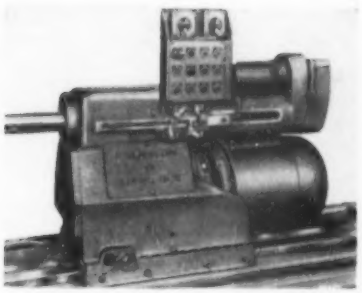


MULTI-PURPOSE MACHINE TOOL —*Morey Machinery Co, Inc, 410 Broome St, New York 13, N Y.* The Hommel can be used for turning, facing, grinding, drilling, planing, jig boring, polishing, slotting, and other jobs. The work can be machined on all sides, usually without changing the original setup.

1953
American Machinist
Production Preview

BORING

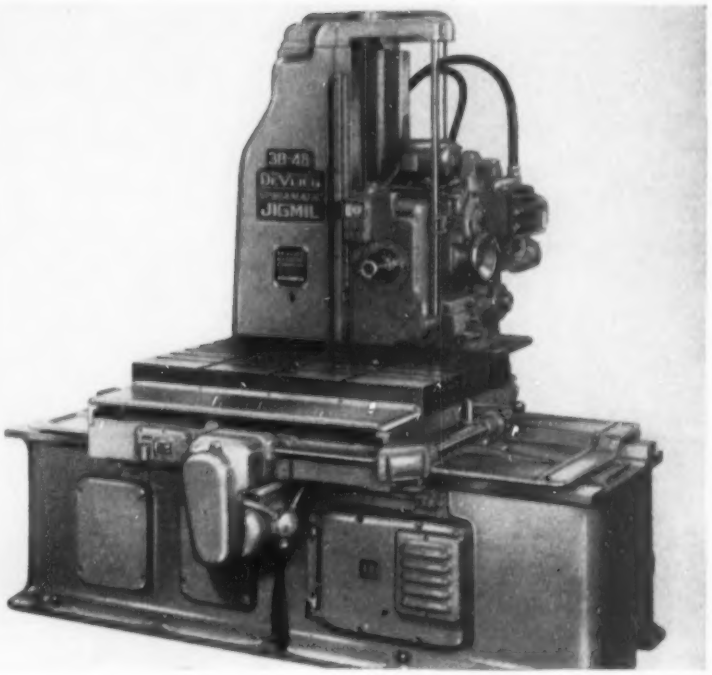




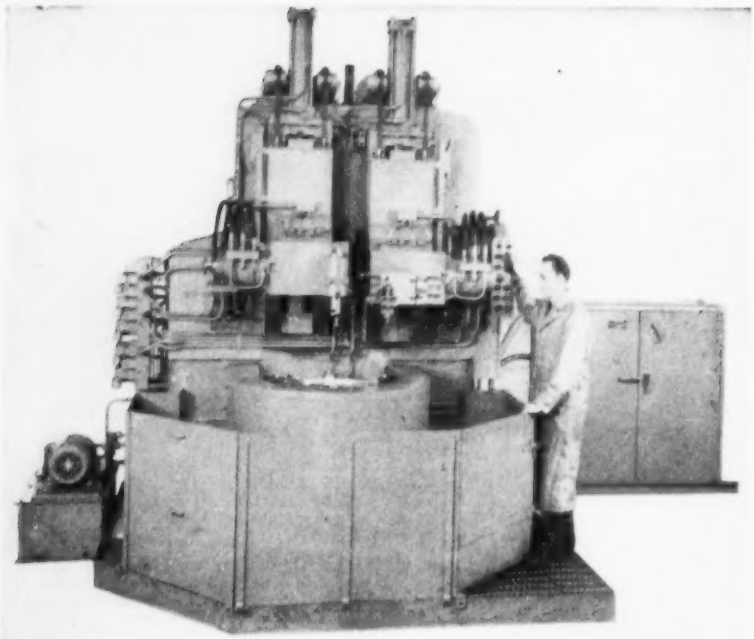
BORING UNIT — *W K Millholland Machinery Co, 6402 Westfield Blvd, Indianapolis, Ind.* Fixed center horizontal boring unit has a high-alloy steel spindle reciprocating through hardened steel bushings. The fluid motor drives through a gear reduction to the lead screw. Horsepower, 5 to 10; spindle speed, 33 to 500 rpm; diameter of spindle, 3 in.; length of bar stroke, 10 in.

JIG BORER—*Kurt-Orban Co, Inc, 21 West St, New York 6, NY.* Lindner (German) units are equally suitable for both measuring and machining operations. In addition to precision boring it is possible to carry out heavy roughing operations without impairing the accuracy of adjustment. Optical system is a direct method and can be read to an accuracy of 0.0004 in.

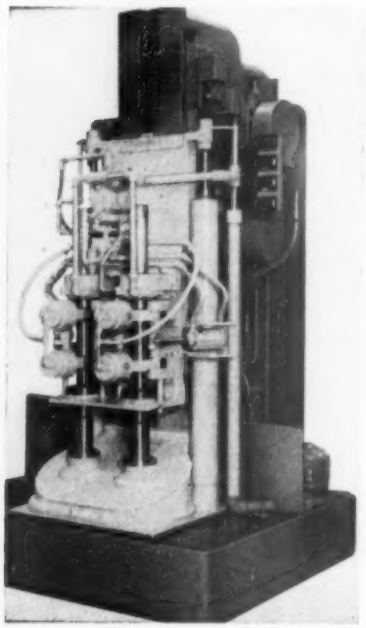
JIG BORER—*Pratt & Whitney Div, Niles-Bement-Pond Co, West Hartford 1, Conn.* No. 1E is the smallest of the line featuring the Electrolimit measuring system. Design improvements include: a heavier and wider bed, table- and carriage-way telescoping guards, a redesigned quill mounting, and centralized controls. The 12x24-in. table has 18-in. longitudinal travel and 12-in. traverse, and the 12x42-in. table has 36-in. longitudinal travel.



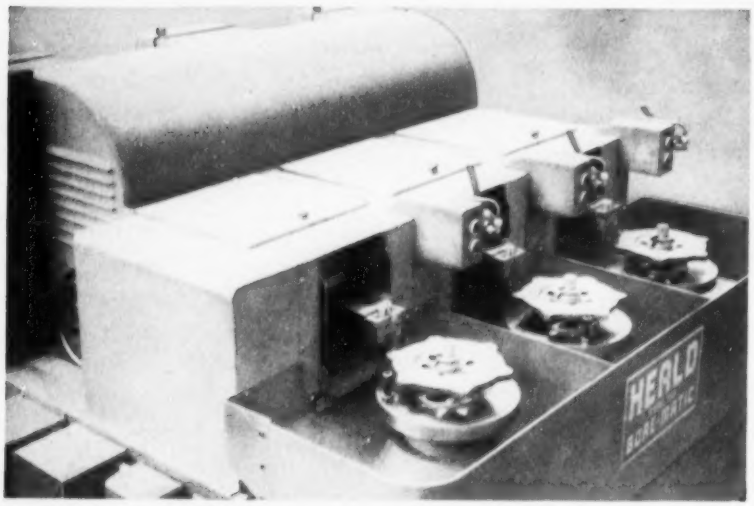
BORING MACHINE — *DeVlieg Machine Co, 450 Fair Ave, Ferndale 20, Detroit, Mich.* DeVlieg Spiramatic Jigmil horizontal boring and milling machines now have Spindle head with automatic transmission and Automatic trip mechanism for spindle bar feed. The Series 3B have 3-in-diameter spindle bar, 48-in. vertical range, and 48-, 72-, or 96-in. horizontal range. The Series 4B have 4-in. diameter spindle bar, 48-in. vertical range, and 60-, 72-, 96-, or 120 in. horizontal range. The Series 3C have 3-in.-diameter spindle bar, 36-in. vertical range, and 72- or 96-in. horizontal range. Series 4C have 4-in.-diameter spindle bar, 48-in. vertical range, and 96- or 120-in. horizontal range.



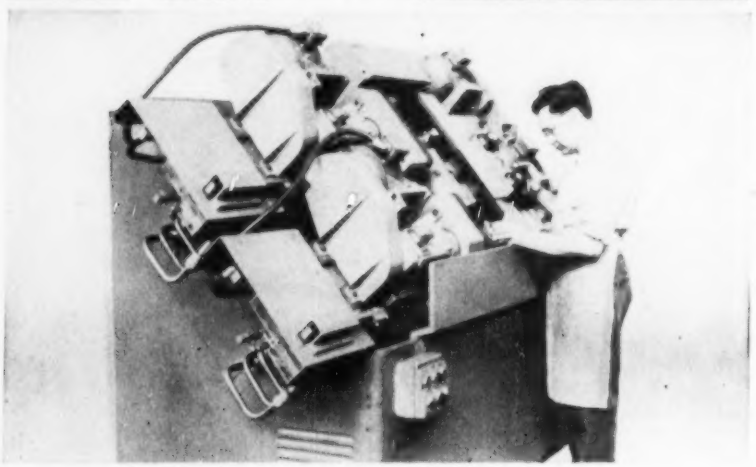
VERTICAL BORING MACHINE—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* The Style-425 vertical boring machine is massive, with a heavy high-speed work spindle and rigid tool slides. These features make it suitable for both close-tolerance and roughing work when doing boring, turning, and facing.



BORING MACHINE—*Baker Bros Inc, Toledo, Ohio.* Machine for boring a 4.2-in. chemical mortar shell is capable of turning out 56 parts per hr at 100% efficiency. Machine is a heavy-duty, two-spindle inverted type utilizing hydraulic feed. A No. 6 More Taper drill provides for use of pick-off speed-change gears.



BORING MACHINE—*The Heald Machine Co, Worcester 6, Mass.* Model-243 Bore-Matic does multiple precision facing and step-facing operations on clutch plates, bell housings, flywheel assemblies, and other similar parts. The three stations may be set up for simultaneous or progressive production runs and loading on any station may be done with others operating.

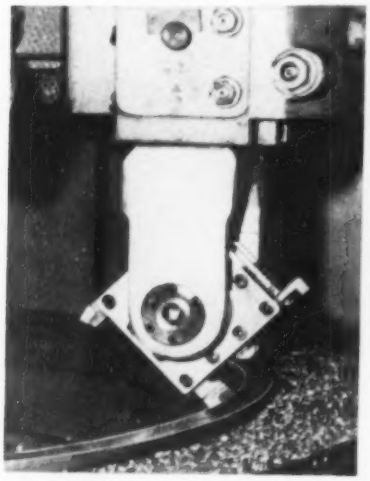


TRANSFER MACHINE — *The Cross Co, Detroit 7, Mich.* Truck axle housings, difficult to handle, move from station to station on palletized fixtures in this Transfer-Matic. Housings from 2½ to 5 tons are produced at 35 per hour at 100% efficiency. Operations include rough and finish boring, rough and finish facing, drilling, spot facing, and tapping.

SPECIAL MACHINE—*Cross Co, Detroit, Mich.* Finishes hourly six tank suspension support housings of cast armor with 42 Rc. Operations include rough and semi-finish boring a multi-dia hole and forming two grooves.

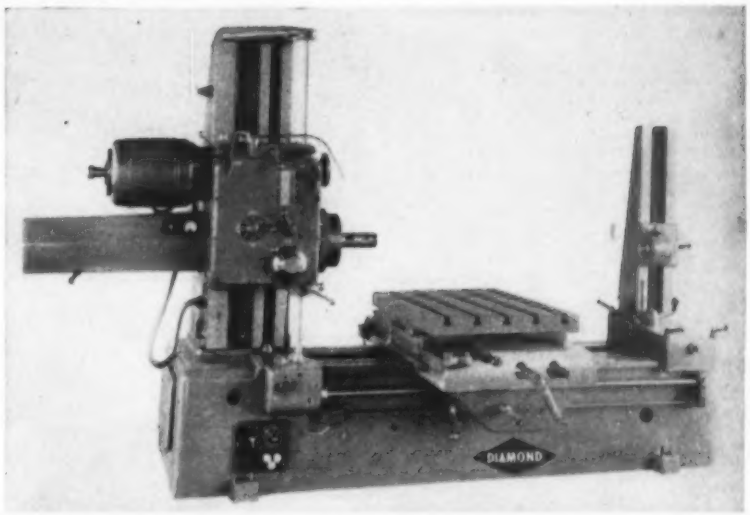
PISTON BORER—*The Heald Machine Co, Worcester 6, Mass.* Wrist-pin holes in pistons are bored by the Model-355 Bore-Matic at the rate of 700 per hr. Basically, the machine consists of four special cross-slides mounted on a fabricated base with a two-station hydraulically operated fixture positioned between the slides.

BORING MACHINE — *Wales-Strippit Corp, 354 Payne Ave, North Tonawanda, NY.* This machine is equipped with a heavy-duty boring head and tooling that permits the boring of holes up to 5 in. in diameter. Known as the DeLuxe Model, for drilling and reaming of holes in material of practically any length up to 36 in. wide.



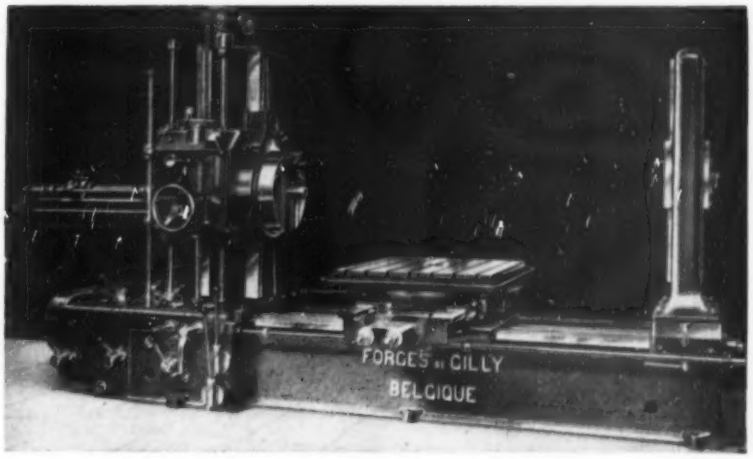
TOOLHOLDER — *Davis Boring Tool Div, Giddings & Lewis Machine Tool, Fond du Lac, Wis.* For use on vertical boring and turning mills, this toolholder requires only one simple wrench adjustment to change position. It enables an operator to turn, undercut, bore, and chamfer with one setup. Four tools can be mounted at once.

HORIZONTAL BORING MILL—*Diamond Machine Tool Co, 3429 E Olympic Blvd, Los Angeles, Calif.* 3-in. horizontal boring machine, the Diamond AL72, is said to have many of the features of larger and costlier machines, including: 18 feeds with rapid traverse in all directions and infinite control of feeds on facing head. The 10-hp. motor is supplied with a unit which regulates amperage load.



VERTICAL BORING MACHINE — *Morey Machinery Co, 410 Broome St, New York 13, N Y.* Column inclined 20° from the vertical, Alfing Model VF 1/600, to lower the center of gravity and increase rigidity. This design also provides more accurate guiding of the spindle, and simplifies loading.

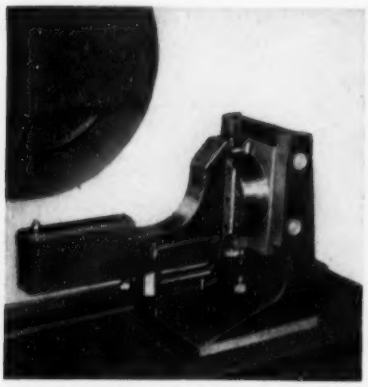
BORING MACHINES—*Morey Machinery Co, 410 Broome St, New York 13, NY.* Two boring machines developed by Alfing Kessler Werke in Germany for the machining of jet-engine parts during World War II. They are the Alfing internal profiling machine for jet-engine shafts and rocket tubes and the Alfing machine for boring the inside of compressor housing.



HORIZONTAL BORING, MILLING—*Stokvis, Edera & Co, Inc, 21 E 26th St, New York 10, NY.* These Belgian-made machines come in five different models, ranging from 2 1/16-in. spindle diameter to 6 19/64-in. diameter. There are two types of floor boring mills made, having respectively 5⅛-in. and 6 19/64-in. spindle diameter.

1953 American Machinist Production Preview

PLANING AND SHAPING



PLANER JAW CLAMPS—*J & S Tool Co, E Orange, NJ.* "Jumbo" and "Lil Giant" clamps for planer tables of any size have compound action, forcing the work down on the table, and across toward opposite clamps on the other side of the work. One adjusting screw clamps or releases each holder.

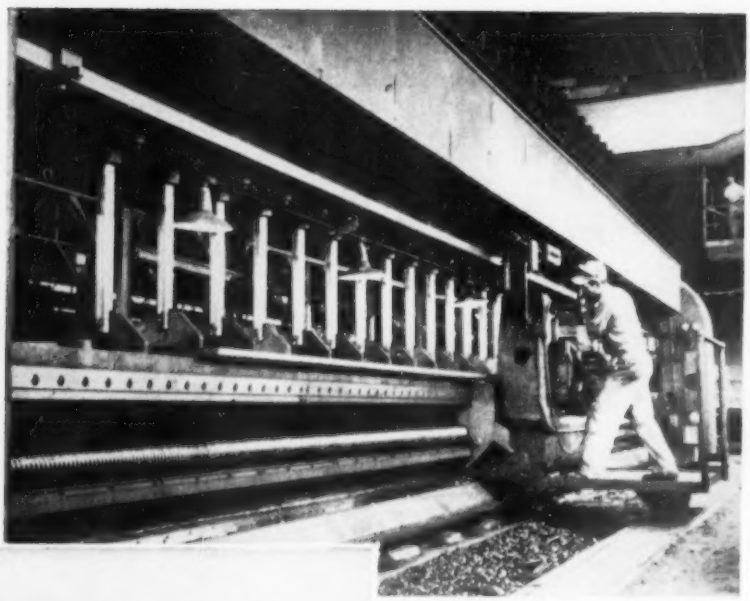
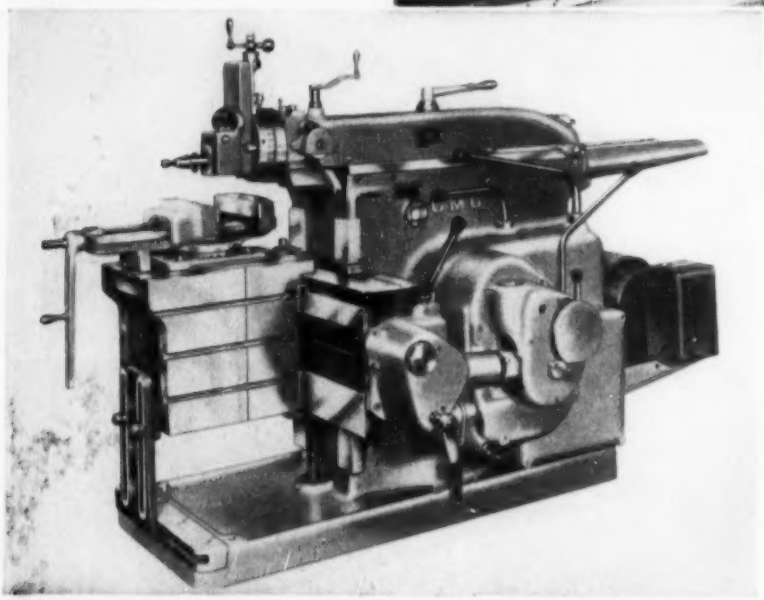
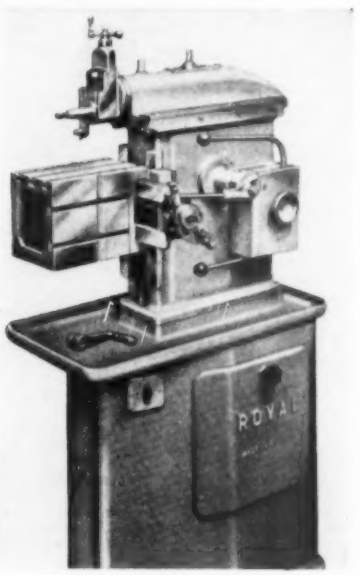


PLATE PLANER — *Baldwin-Lima-Hamilton Corp, Philadelphia 42, Pa.* Used primarily to bevel steel plate prior to welding, this 40-ft. open-throat planer has a top carriage speed of 45 fpm. With a ⅛-in. feed and a carriage travel of 15 fpm, it removes 34 cu. inches of material a min. from mild-steel plate 1½ in. thick.

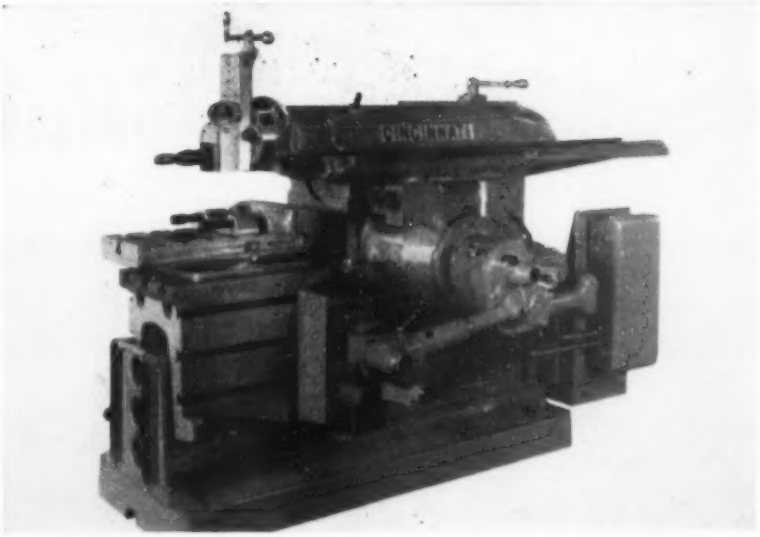


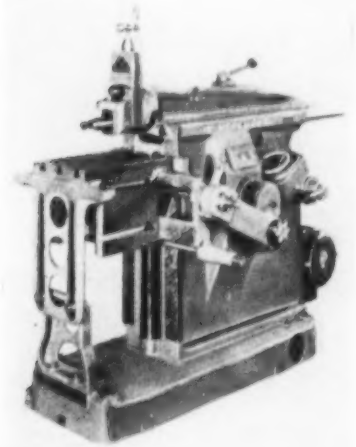
CRANK SHAPERS—*Manufactured by Canada Machinery Corp, distributed by: Pitnam Industrial Products Co, Div of Cement & General Development Corp, 608 Fifth Ave, New York 20, NY.* CMC line of rapid traverse pattern crank shapers has capacities from 18 to 36 in. per stroke. A single lever controls the feed and rapid power traverse engagement and direction of table movement, horizontally and vertically, if the latter is required.



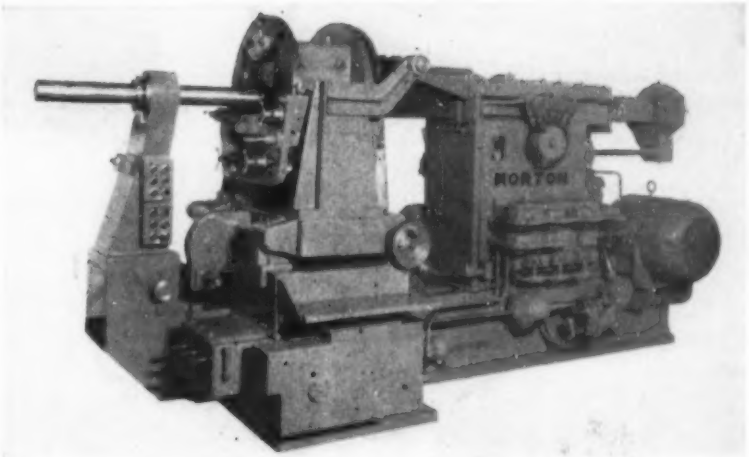
SHAPER—*The Hall Tool Co, 3420 Market St, Philadelphia 4, Pa.* The swiveling box table has three T slots in the top face and in one side has two horizontal T slots and a vertical V groove for holding round bars. The toolhead swivels through 120°. Power feeds to the table both transversely and vertically.

SHAPER—*Cincinnati Shaper Co, Hopple & Garrard Streets, Cincinnati 25, Ohio.* Electromagnetic Clutch and Brake on Shaper provide instant starting and stopping with a single fingertip control lever. The ram can be positioned quickly and accurately for setting tools—up to 30% of total time on some jobs. There is no adjustment on the clutch or brake required for the life of the friction surface.



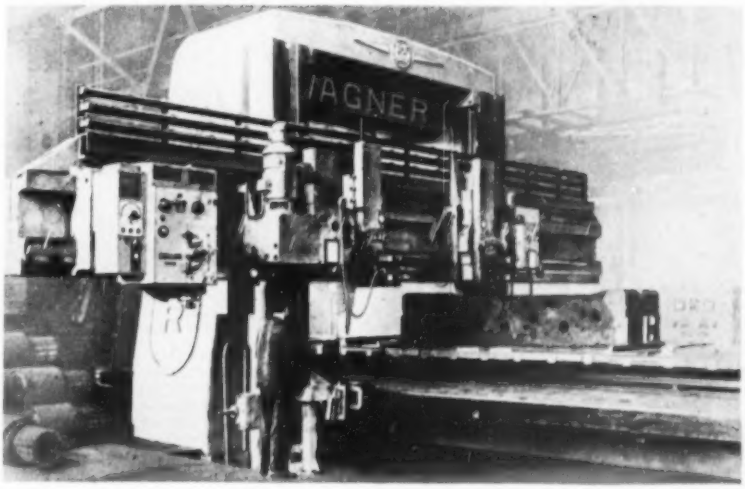


SHAPERS—*Parker Machine Co, Inc, 158 Pioneer St, Brooklyn 31, NY.* Hercules shapers have a 16-in. stroke, and are equally suited to production and toolroom work. Features include: automatic pressure lubrication to gearbox, bull-gear main bearing, rocker-arm slide block, and ram guide ways; V-belt motor drive; a cutting-speed indicator for six speeds of 26 to 152 strokes per min; and 7-in. swivel vise with jaw opening of 8 in.



HYDRAULIC SHAPER—*Morton Mfg Co, Broadway & Hoyt, Muskegon, Mich.* Morton draw-cut shaper is designed for machining the rectangular tapered openings in forged or cast steel breech rings from 76 to 155 mm sizes. Ram is reciprocated hydraulically and has adequate capacity for removing heavy cuts at maximum feeds.

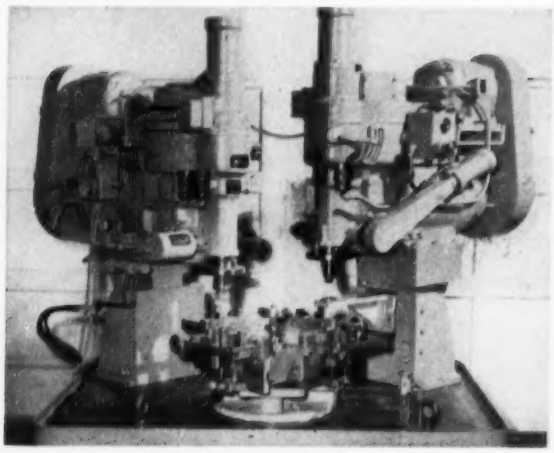
SHAPER—*Transmares Corp, 15 William St, New York 5, NY.* The Doerfinger heavy-duty shaper employs a crank mechanism for table feed. Other features include: 1) automatic tool lift; 2) revolving table with graduated dial, firm support in all working positions. Maximum stroke of ram is 20¼ in. with max distance table to ram 17 in. Imported by: Transmares Corp.



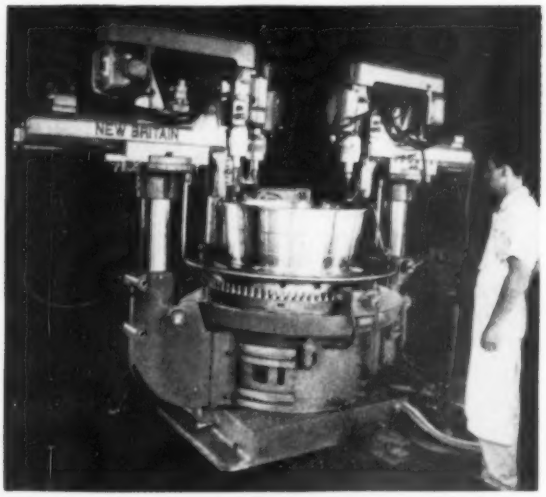
PLANER—*Kurt Orban Co Inc, 205 E 42nd Street, New York 17, NY.* Transverse, vertical, bevel and longitudinal planing operations can be carried out with a single setup on work as large as 177 in. wide by 110 in. high by 394 in. long on the Wagner double-column planer. Table is divided into two sections with independent travel. While one piece is being machined on the section of the table under the cross-rail, a second piece can be setup on the stationary section.

1953 American Machinist Production Preview

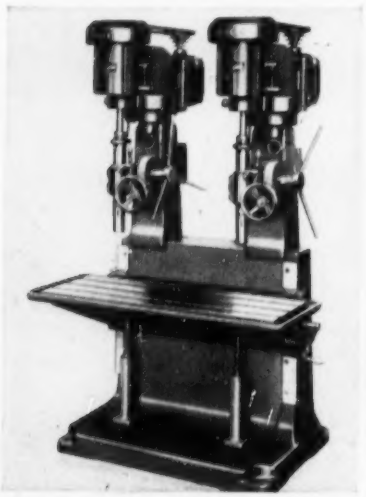
DRILLING



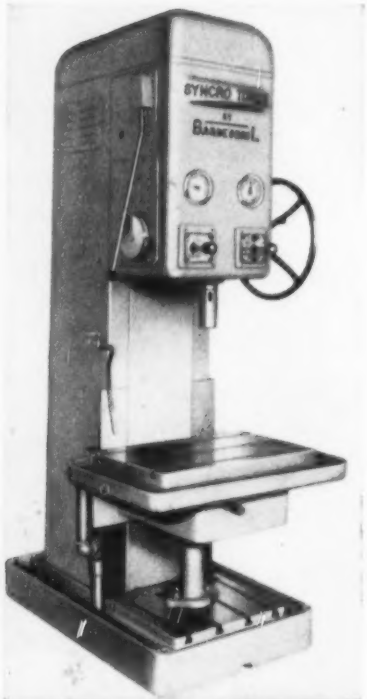
DRILLING AND TAPPING — *Kaufman Mfg Co, Manitowoc, Wis.* Arranged with a No.-10A tapping head, a No.-10 reaming head, and a No.-18 indexing fixture on a special base. Both heads are arranged for single-spindle drilling, tapping, reaming, and threading. Drive is through V-belts to a 6-speed transmission on the reaming head, and through cone clutches in oil on the tapping head.



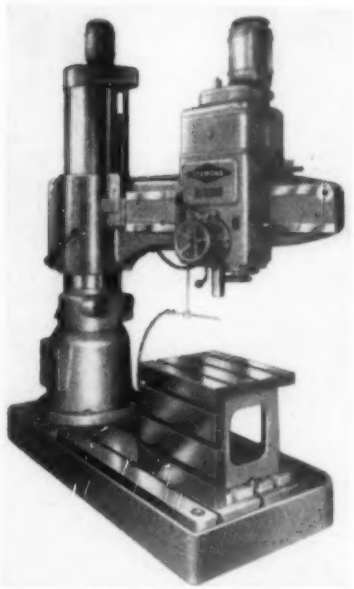
DRILLING MACHINE — *New Britain Machine Co, New Britain, Conn.* Without the use of expensive drilling fixtures and with standard indexing—regular or irregular hole spacings of from 4 to 100 indexes and circles to 48 in. dia. Will take pieces up to 61 in. dia.



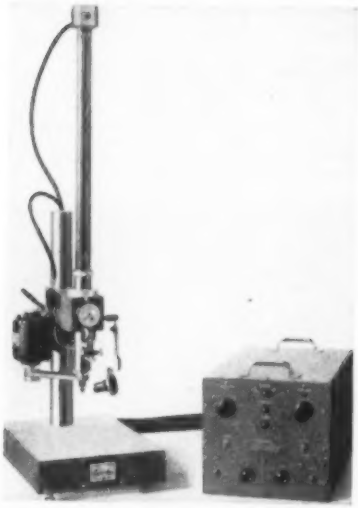
DRILL — *Sibley Machine & Foundry Corp, South Bend, Ind.* Model MC-20 drilling machine, 2-spindle, 20-in. swing, has been redesigned for more rigidity. Column and base are heavier to drill to 1¼ in. in mild steel. The drill is also said to be sensitive for small size drills.



DRILLING MACHINE—*Barnes Drill Co, 830 Chestnut St, Rockford, Ill.* This sturdy drilling machine features the Barnesdril Syncro-Torque drive, which provides constant full-rate hp delivery under all conditions of speeds and feeds. The machine has a 21-in. swing and a 1¼-in. capacity in steel.



RADIAL DRILL—*Diamond Machine Tool Co, 3429 E Olympic Blvd, Los Angeles 23, Calif.* Heavy-duty radial drilling machine with sizes from 3 through 8 ft has column and sleeve of ample dimensions to withstand stresses even in the most unfavorable position.

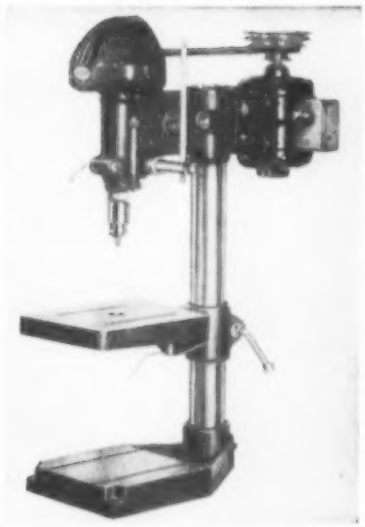


DRILLING MACHINE — *Teletronics Laboratory, Inc, 352 Maple Ave, Westbury, LI, NY.* Model 200 Microdrill is a precision drilling machine for microscopic holes. Drill capacity ranges from 0.001 to 0.025 in. Drill collet is a standard 0.040 in. or optional 0.032 in. Throat depth in 6 in. Maximum recommended electronic feed travel is 0.20 in. Spindle speed from 0 to 5000 rpm.

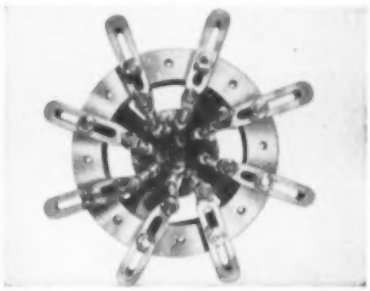
TAPPING AND DRILLING — *Ettco Tool Co, Inc, 594 Johnson Ave, Brooklyn 37, N Y.* Designed for use with either multiple- or single-spindle drilling and tapping heads, and with provision for interchangeable work holders. An electrically controlled four-way air valve with a built-in up and down speed control enables the machine to be run on a continuous automatic cycle or single-stroke operation controlled by foot or hand.

TAPPING-DRILLING UNITS—*Beckett-Harcum Co, Inc, Wilmington, Ohio.* Beckett air-controlled tapping-drilling machines are able to perform single and multiple tapping direct from the drill chuck or standard multiple drill head, without employing leadscrews, clutches or tapping heads. Absolute and precise control of air power is used to feed the tap through the work.

DRILLPRESS — *Clausing Div, Atlas Press Co, 2304 N Pitcher St, Kalamazoo, Mich.* Capacity in steel is ¾ in. Features of this heavy duty drillpress include: drive spindle supported by two sealed ball bearings, vernier depth stop with control accurate to 0.001 in.; 6½ in. spindle travel.

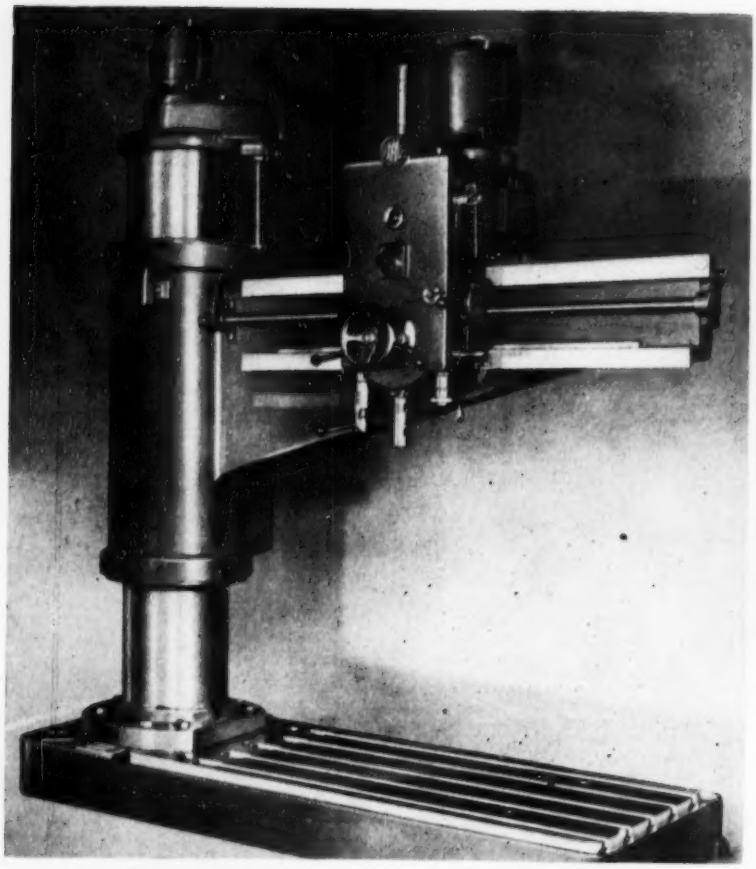


DRILLPRESS — *Boice-Crane Co, 935 Central Ave, Toledo 6, Ohio.* The 1650-Series drillpress has a combination belt aligner and tensioner. Belt tension can be instantly released without wrenches or tools.

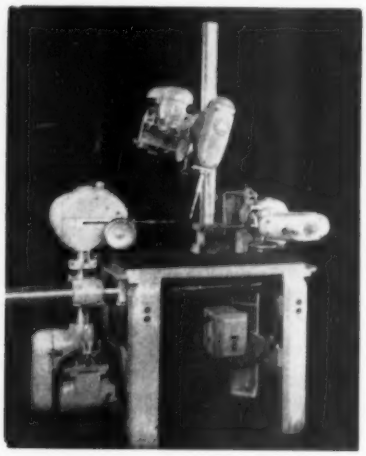


DRILLING HEAD — *Errington Mechanical Laboratories, Inc, Staten, Island 4, NY.* Adjustable to any pattern of holes. It is available with 4 to 12 spindles. Two sizes are No. 0, 0 to ¼ in. with a full range of collets furnished; No. 1, 3/16 to ½ in. — No. 1 Morse Taper socket or chucks for straight shank drills.

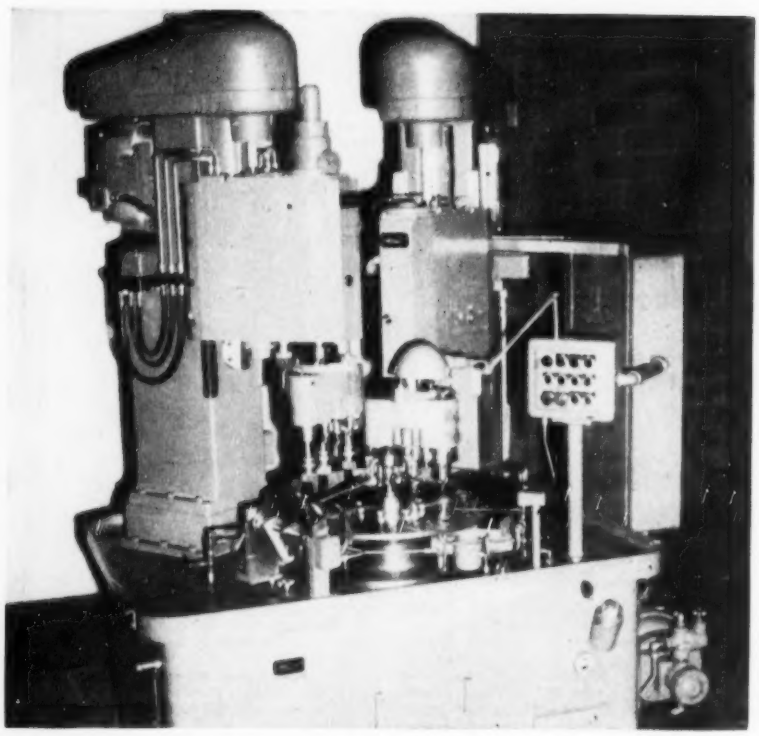
DRILLING DEVICE—*Bellows Co, 230-236 W Market St, Akron 9, Ohio.* A drilling device named the Hydrair is electrically controlled, but air powered with the feed rate hydraulically controlled. Drilling capacity is ¼ in. with maximum depth of stroke 4 in. The Hydrair features rapid advance, controlled feeding through the work and rapid return.

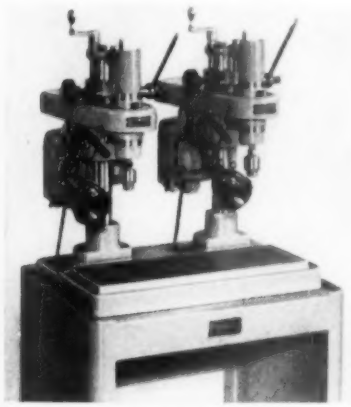


RADIAL DRILLS — *Parker Machine Co, Inc, 158 Pioneer St, Brooklyn 31, N Y.* Maxim (French) heavy-duty radials come in two models with different size columns—15¾- and 17½-in.-dia. Drilling capacity in mild steel is 2 and 2½ in., respectively, with 20 spindle speeds of 32-2500 and 25-2000 rpm range, respectively.



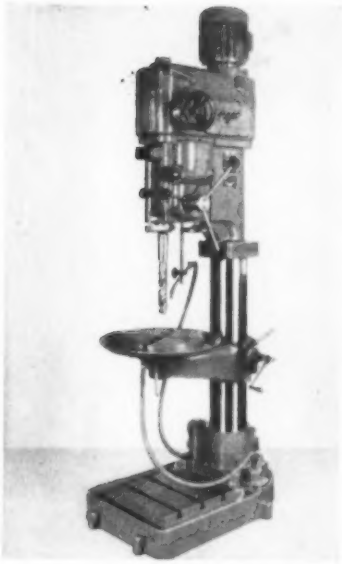
DRILLPRESS — *Magna Engineering Corp, Menlo Park, Calif.* The drillhead tube, which is always perpendicular to the vertical-column tube, permits two additional degrees of freedom not previously available to drillpresses. These are rotation of the head through 360° around the horizontal tube, and displacement along this tube to provide a variable throat. Maximum throat is 14 in., minimum 6½ in. Capacity steel is ¾ in.



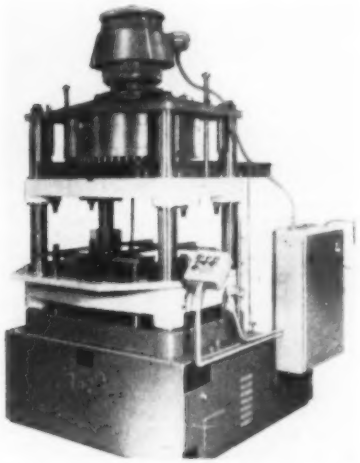


SMALL-HOLE DRILL—*Hamilton Tool Co, Hamilton, Ohio.* Small-hole, precision drilling machines are available in single base multiple spindle design, with capacities of 0.004 in. to 5/16 in. hole dia, clearances up to 8 in. from center of chuck to column, up to 14 in. from base to chuck.

DRILLING MACHINE — *Kaufman Mfg Co, Manitowoc, Wis.* This hydraulically operated, electrically controlled machine for drilling, reaming, tapping, and threading, has a fast index table which can be furnished with any number of divisions and with built-in, self-centering 3-jaw chucks.



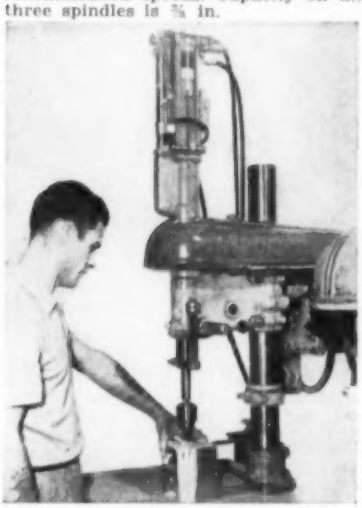
BORING AND DRILLING—*Eric R Bachmann, 27-11 - 41st Ave, Long Island City 1, N Y.* This heavy-duty column boring and drilling machine from Germany features variable speed control during boring by installed P.I.V. gearing. The machine has drilling capacity of 1¾ in. in cast iron. Maximum distance spindle-center to column-face 13¾ in.



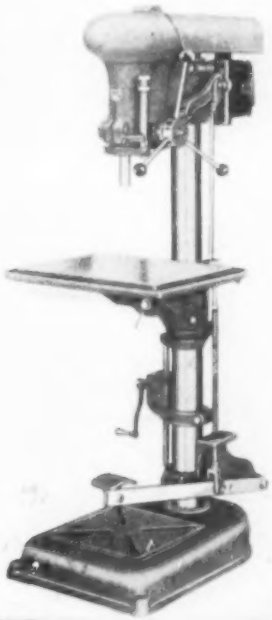
DRILLER — *Zagar Tool, Inc, 24000 Lakeland Blvd, Cleveland 23, Ohio.* Zagar has standardized four sizes of heavy-duty drilling machines to produce as many as 600 holes at one time. They are 16, 24, 32, and 40 in. and are designed to take interchangeable drill-heads.

DRILL FEED GUARD—*General Pacific Corp, 1501 E Washington Blvd, Los Angeles, Calif.* Fits over the depth-control dial of the General Time Saver drill feed to eliminate tamperig. Automatic power feed is for any drillpress operating on ordinary shop air line pressure. Three quick-setting control dials—for hole depth, rapid traverse, and variable hydraulic feed.

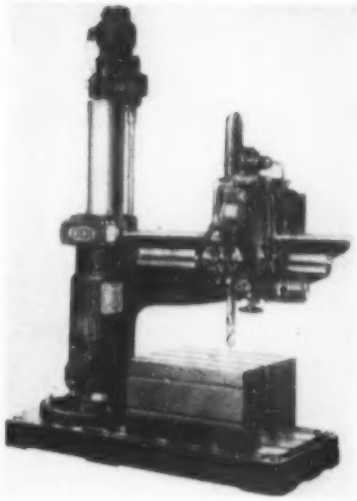
TURRET DRILL HEAD—*Commander Manufacturing Co, 4225 W Kinzie St, Chicago, Ill.* Called Select-A-Spindle, this tool provides a selection of speeds on each of three spindles for drilling, reaming, counterboring, and tapping at recommended speeds. Capacity on all three spindles is ⅝ in.



DEEP-HOLE DRILLER—*The General Detroit Corp, 2200 E Jefferson, Detroit, Mich.* Deep-hole driller feeds the drill into the work at infinitely variable rate, and to a depth of step varying from 1/32 to ⅝ in., repeating until predetermined depth of the hole has been reached. Unit may be used as a conventional drill-feed unit.



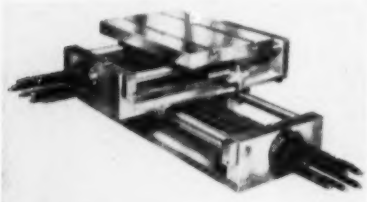
DRILLPRESS—*Duro Metal Products Co, 2681 N Kildare Ave, Chicago 39, Ill.* Some of the improvements in this drillpress are: alloy-steel spindle, larger in dia and precision ground; and permanently lubricated, sealed ball bearings. Capacity in cast iron is ¾ in. and spindle taper is No. 2 Morse.



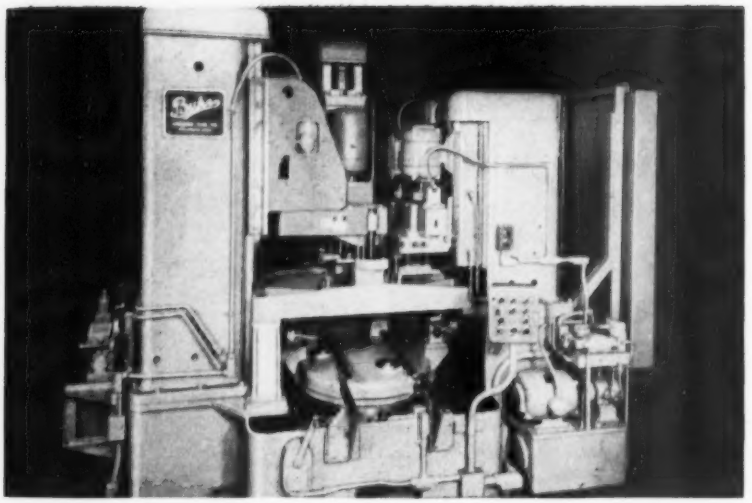
RADIAL DRILL—*Tri-State Machinery Co, 3041 W Liberty Ave, PO. Box 8051, Pittsburgh 16, Pa.* Centralized controls, extreme rigidity, and ease of operation. Both the head and arm are supported on roller bearings.

DRILLPRESS—*Kurt Orban Co, Inc, 205 E 42nd St, New York 17, NY.* Model BK-25 is made by the Alfing Works, West Germany. Table and headstock are both adjustable; table is raised and lowered by a crank and supporting screw, and locked in place by a lever. Headstock is moved by hand over a distance of 6 in. Drilling capacity is 1 in. in steel and 1¼ in. in cast iron.

DRILLPRESS — *Walker-Turner Div, Kearney & Trecker Corp, Plainfield, N J.* This redesigned line of drill presses has a ½-in. capacity in cast iron and will drill to the center of a 15-in. circle. Spindle travel is 6 or 4¼ in. 72 different models of this machine, including bench, floor and multi-spindle are available.



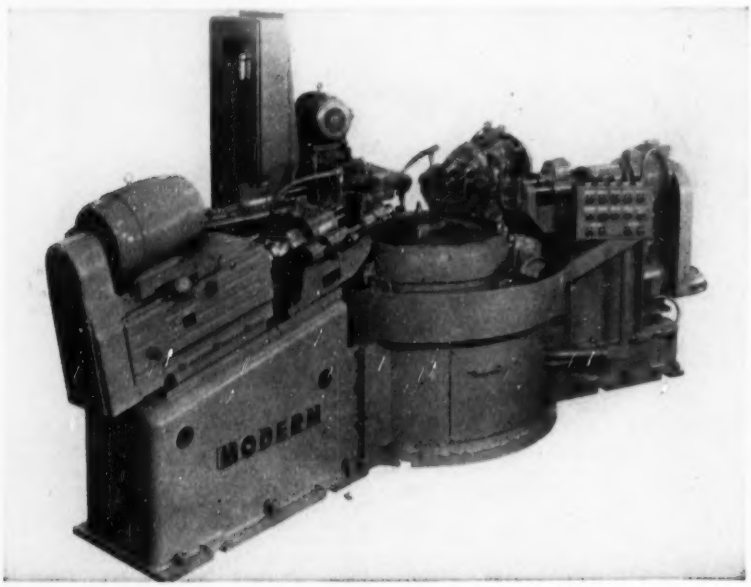
MULTI-POSITION LOCATING DEVICE—*The Queen City Machine Tool Co, 217 E Second Street, Cincinnati 2, Ohio.* This device, known as the Speedi-Spacer, is used in the location of parts for drilling, boring, or milling. Positive positioning is provided by 9 longitudinal and 9 transverse stop screws.



SPECIAL MACHINE — *Govro-Nelson Co, 1933 Antoinette, Detroit 8, Mich.* Five radial holes and two parallel holes are drilled simultaneously in an aluminum part. Six Model KH self-contained automatic drilling units are used. Output rate is 500 parts per hr.

SPECIAL MACHINE—*Modern Industrial Engineering Co, 1430 Birwood Ave, Detroit 4, Mich.* Semi-automatic machine has four heads located at 45° positions around the index table, to drill, bore, and face jet compressor housings. Manual indexing has been provided to permit inspection of both the tools and the part between successive operations.

DRILLING MACHINE — *Modern Industrial Engineering Co, 14230 Birwood, Detroit 4, Mich.* This machine features interchangeable multiple drillheads on two of the five stations. This enables several types of housings having a variety of bolt-circle specifications to be machined on faces with identical radial locations.



SPECIAL DRILLING MACHINE — *Buhr Machine Tool Co, Ann Arbor, Mich.* Consist of a main base, to which are mounted four vertical hydraulic drill units, a single part-holding fixture, and a 36-in.-dia 10-station index table, and a central coolant system. The work is on an airplane supercharger.

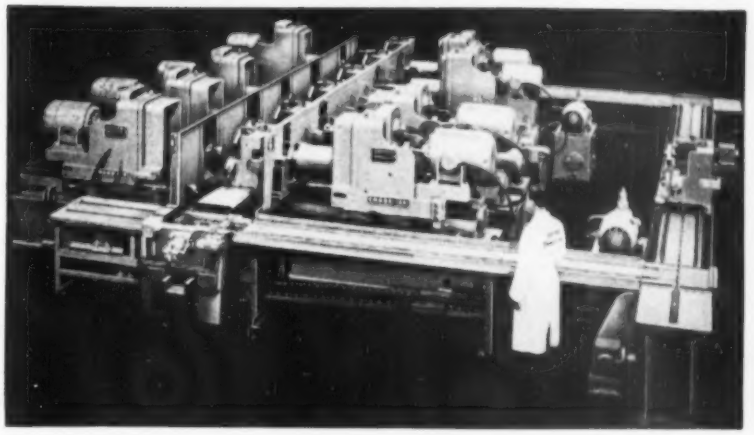
DRILLING MACHINE — *Buhr Machine Tool Co, Ann Arbor, Mich.* Has individual lead-screw tapping and five ways. The holding fixture is mounted on a carriage, and is transferred manually from station to station as eleven drilling and chamfering operations and nine tapping operations are performed on suspension supports for army tanks.

DRILLING AND TAPPING — *Buhr Machine Tool Co, Ann Arbor, Mich.* Drills, chamfers, and taps 12, 9/16-18 holes in each end of the tank part. Tooling consists of a 24-spindle drill head and a 12-spindle individual lead-screw tapping head and one 4-station fixture, mounted on a four-position automatic index table.

TRUNNION MACHINE — *Buhr Machine Tool Co, Ann Arbor, Mich.* Has two horizontal 30-in way hydraulic units and one 8-in. Processes 880 valve rocker arms per hour at 100% efficiency. Features include automatic clamping and ejection of parts, automatic lubrication, and checking spindles for small holes. Tooling includes 6-station trunnion fixtures loading four parts to a station with power indexing a 20-spindle right-hand head, 12-spindle left head and 4-spindle rear head.

SPECIAL MACHINES—*Buhr Machine Tool Co, Ann Arbor, Mich.* Drill and tap 24 blind holes inside a jet-engine bearing support by two special machines. A reciprocating drillhead on a hydraulically operated slide has four drill spindles. Rotary table features irregular spacing—with the table electrically interlocked holes can be drilled only in their proper relative positions. The tapping machine functions the same as the driller except that taps are driven by a master lead-screw.

TRANSFER MACHINE — *National Automatic Tool Co Inc, Richmond, Ind.* Does 101 automatic operations including inspection in 1.1 min. Fifty cylinder blocks an hour are turned out with one operator at the controls. It mills, trepans, drills, counterbores, reams, chamfers, automatically turns part 360° while vibrating to remove chips, and finally automatically inspects.

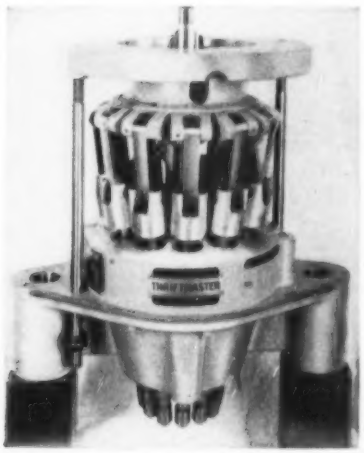


TRANSFER MACHINE — *Greenlee Bros & Co, Rockford, Ill.* 18 stations process V automotive cylinder blocks. Performs 110 machining operations in 38.3 seconds. Drilling, reaming, boring, counterboring, and core-drilling operations are performed in machining the banks, sides, and starter mounting pad of the blocks.

TRANSFER MACHINE—*The Cross Co, Detroit 7, Mich.* Finishes 6½ tank idler arms per hour. Because of the odd shape of the idler arms, palletized work-holding fixtures are used to hold each part during all operations. An integral conveyor returns the fixtures from the last station to the loading station.

CYLINDER-BLOCK MACHINE — *Cross Co, Detroit 7, Mich.* 120 V-8 Cylinder blocks per hr. 19 stations include: one for loading; ten for drilling, boring, reaming, countersinking, and spotfacing; two for gaging; one for cleaning; four idle; one for unloading. A Cross machine-tool control unit is incorporated which automatically stops machine when any tools need changing.

TRANSFER MACHINE — *Cross Co, Detroit 7, Mich.* Bores and faces flywheel housing and cylinder-block assemblies. A single unskilled operator is able to produce 81 pieces per hour at 100% efficiency. The machine bores the transmission hole and faces the transmission face concentric and square with the crankshaft bore.



DRILLHEAD — *Thriftmaster Product Corp. 1070 N Plum St. Lancaster, Pa.* Angular-type drillhead with fixed center drills 12¼-in. holes at 10° angles on the trap in a 3.5-in. high-explosive antitank rocket. Drillhead has 1:3 gear ratio.

TRANSFER MACHINE—*Snyder Tool & Engineering Co, 3400 E Layfayette Ave, Detroit, Mich.* Three similar cast-iron intake manifolds, each requiring different machining operations, can be produced in a line-index transfer machine without changing or resetting tools. The only adjustment needed when changing over to a different manifold is the turning of a drum control switch.

TRANSFER MACHINE—*Snyder Tool & Engineering Co, 3400 E Lafayette, Detroit 7, Mich.* Drilling, rough and finish boring, milling, sawing, tapping, spotfacing, counterboring, and chamfering—a total of 37 operations on 105 surfaces or holes of various dimensions. The work is a cast-iron clutch housing with a production rate of 124 cycles an hr at 80% efficiency.

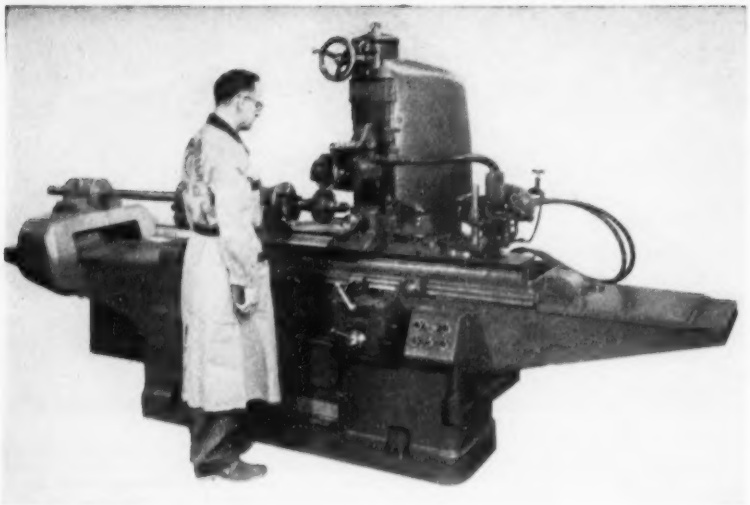
TRANSFER MACHINE—*Snyder Tool & Engineering Co, 3400 E Lafayette, Detroit 7, Mich.* Main bearing caps are processed in clusters, sawed apart and sorted, at the rate of 96 per hour at 80% efficiency. The 19 stations include drilling, reaming, spot-facing, tapping holes, milling anchor slots, sawing the cluster into individual caps, and sorting finished parts.

MACHINE TOOL—*The Cross Co, Detroit 7, Mich.* For boring, drilling, chamfering and rearming oil-pump bodies, uses only one unskilled operator to produce 95 pieces per hour at 100% efficiency. It consists of six stations, one loading and five working.

SPECIAL MACHINE—*Cross Co, Detroit 7, Mich.* For exhaust manifolds mills and drills the mounting face, and mills, bores, drills, and taps the tail-pipe pad on 120 manifolds per hr at 100% efficiency. Right- or left-hand parts are machined without changing the setup. Six stations are used; one for loading, two for milling, two for drilling and boring, and one for tapping.

SPECIAL MACHINE—*The Cross Co, Detroit 7, Mich.* Works on cast armor of Rc 35 hardness. Drills ,chamfers, and taps four holes and drills, chamfers and reams one hole in tank intermediate- and rear-wheel arms. Production of 64 pieces per hr is possible. Of these, 32 are right- and 32 left-hand arms. A duplex work-holding fixture holds one right and one left-hand part in each of stations. Machine is a dial index, table type.

DRILLING



GRINDER—*National Broach & Machine Co, 3600 St Jean Ave, Detroit 13, Mich.* The Red Ring Helical Gear Grinder Model SGP, while designed primarily for the high precision form grinding of helical gears, may also be used for spur gears and splines. The machine uses the lead-bar principle with certain refinements for the maintenance of the true helix angle or lead.

INDEXING MACHINE—*Avey Drilling Machine Co, Inc, Cincinnati 1, Ohio.* Completes the following operations on 8 to 12 tank clutches per hour: drills 24 holes to 13/32 dia, removes burrs, counterbores 24 holes and mills 12 notches to depth, end mills two notches through, and end mills three additional individual notches. The machine has five Avey automatic No. 2 Cam Feed Units.

DRILLING AND TAPPING TABLE—*Beaver Machine & Tool Company, Inc, Syracuse, NY.* Has five Locke air-opened drilling and tapping units, bezel fixture, fixture clamp, motor support brackets, and pedestal. Each drill unit, activated by a solenoid switch, is powered by a ½-hp electric motor mounted under the table. Five drills enter the fixture drill bushings and drill and countersink the holes.

DRILLING UNIT—*Drillunit, Inc, 637 Mt Elliott, Detroit 7, Mich.* The Drillunit is a small self-contained head which can be mounted on a machine in any position for extra drilling and boring jobs. It weighs only 175 lb. The spindle is direct-driven by an electric motor; control is by push-button; traverse rate is over 400 ipm, feed rate up to 30 ipm; and capacity ½ in. in steel.

→

TRANSFER MACHINE—*The Motch & Merryweather Machinery Co, 715 Penton Bldg, Cleveland 13, Ohio.* Takes solid cold-drawn stock and drills it, countersinks, broaches flats on both sides, cuts it off to accurate length, and finally chamfers both ends of the cut-off pieces. The machine handles 300-differential pinion shafts per hr at 100% efficiency.

INDEX MACHINE—*The Avey Drilling Machine Co, Inc, Cincinnati 1, Ohio.* Multiple spindle drilling and tapping operations on a tank manifold part, two No. 2 Avey automatic feed units mounted horizontally and at suitable positions on a 40-in. index table.

DRILLING MACHINES — *The Avey Drilling Machine Co, Inc, Cincinnati 1, Ohio.* Four No. 1 Aveydraulic Torquematic drilling units have 12-in. ram travel with remote start to drill twelve ¼-in. holes in a tank crankshaft. Machine has built-in hydraulic power source and is made to J.I.C. electric standards.

DRILLPRESS ATTACHMENT — *The DoAll Co, Des Plaines, Ill.* Spring-Master attachment makes springs in a wide range of wire sizes and dia at highspeed .In can be applied to any drillpress with ½-in. chuck or larger. It is possible to wind wire dia's from 0.020 in. to 0.071 in. with outside dia of springs varying from 3/16 to ⅝.

SPECIAL MACHINE—*Black Drill Co, 1400 E 222nd St, Cleveland, Ohio.* Eight Black drilling units designed into this special machine, engineered and built by Bartelt Engrg Co, speed up production of 60mm mortar shell fins. Completely automatic two-station unit employs one operator for feeding and unloading both stations at end of each cycle.

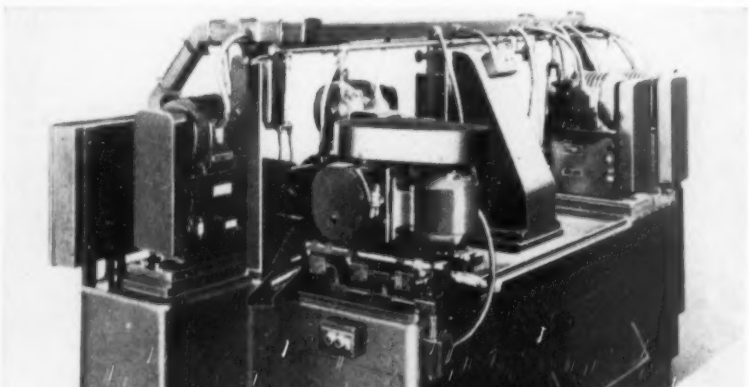
DRILLING UNIT—*Black Drill Co, Inc, 1400 E 222nd St, Cleveland, Ohio.* Combines features of the standard traversing motor-shaft drilling unit with a 4-in working travel and a skip-stroke attachment, for deep drilling, drilling in hard-to-get-at locations, and accurate drilling in materials requiring frequent chip clearing.

DRILL JIG—*Porter Precision Products, PO Box 99, Cincinnati 31, Ohio.* The Por-Matic air-operated drill jig will handle work up to 1 in. dia. The body of the fixture is secured to the table of any regular ½-in.-capacity drillpress. The fixture will accommodate drill sizes up to 5/16 in. dia.

TWO-STATION DRILLER — *Zagar Tool Inc, 24000 Lakeland Blvd, Cleveland 23, Ohio.* Machines six power take-off holes on each side of seven different transmission cases. It consists of four hydraulic feeding units and four gearless drillheads. The cycle is automatic.

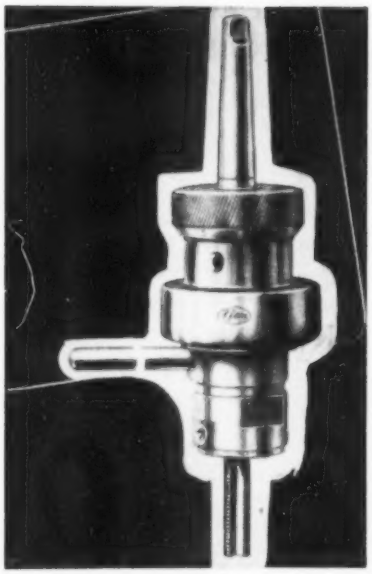
DRILL UNIT—*Alkon Products Corp, 698 East 142nd Street, New York 54, NY.* The Gurmendi air drill unit uses a hydraulic monitor which results in quick approach to the work, and positive adjustment rate through the work. The spindle is equipped with a ¼-in.-capacity Jacobs chuck.

DRILLPRESS FEED — *The Bellows Co, 230 W Market St, Akron 9, Ohio.* By measuring torque on the drill, "senses" what is going on in the bottom of the hole and sees that the drill is withdrawn only when the strain approaches the danger point. The unit consists of a Sensor Cabinet mounted on a standard Bellows Model DFE 2-540 drillpress feed.

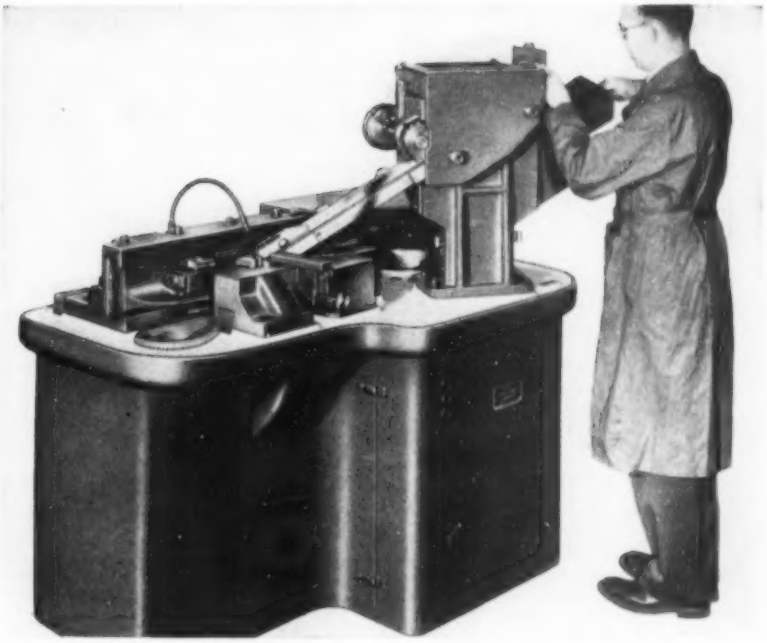


1953 American Machinist Production Preview

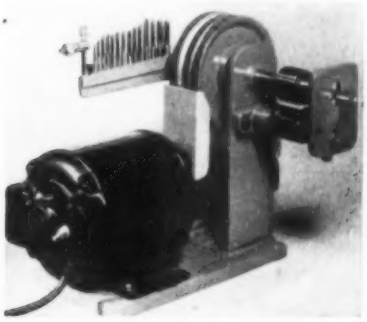
TAPPING AND THREADING



DIRECT-DRIVE TAPPER—*Precision Products Co, 76 Rogers St, Branford, Conn.* The Microtrue is a direct-drive tapper equipped with an adjustable safety clutch. Tapping speed is spindle speed; on lifting spindle lever, tap reverses at double speed.

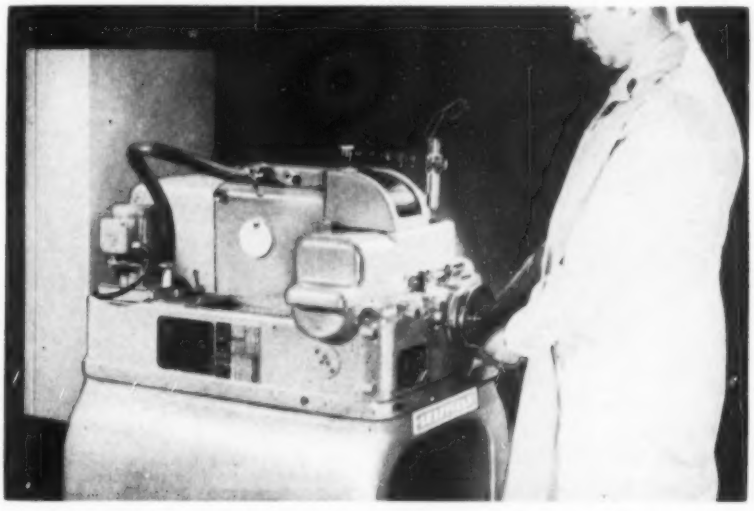


AUTOMATIC THREAD ROLLER — *Hartford Special Machinery Co, 287 Homestead Ave, Hartford 12, Conn.* The Model A-312 H will roll machine screws from size No. 6 to 5/16 in. in diameter and thread lengths up to 2½ in. Production rates are 80, 100, 120, and 140 pieces per minute depending upon size of screw to be rolled. Floor space required is only 4x6 ft.



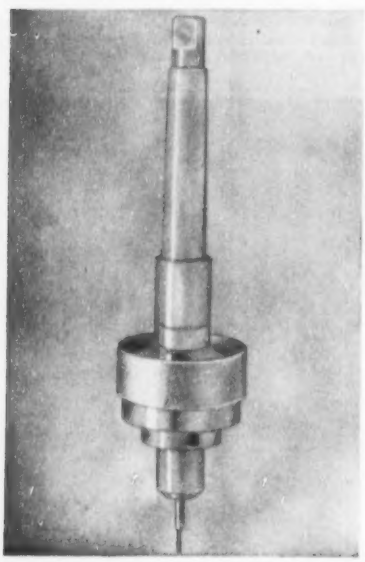
HAND-THREADING MACHINE — *Herb M Field, Portland 12, Ore.* The Field Sensi-Threader is designed to cap holes and cut threads accurately and speedily by hand. The new model EBB has a tap and die capacity of 10-24 to ⅜-16 with 1/3 hp.

TAP HOLDER — *Roddick Tool Co, Anaheim, Calif.* Will work either right- or left-hand threading; depends upon steel balls for releasing action. Action is claimed to so smooth that threading may stop and start at any point without difficulty. On heavier machines, power feed may be used, providing feed does not exceed threading rate of tool.



SMALL THREAD GRINDER — *The Sheffield Corp. Dayton 1, Ohio.* Model 133 thread and form grinder is specifically designed to handle threads 20 pitch and finer. Finest pitch recommended in the US form is 124, though finer pitches can be ground in the Whitworth form. The machine will handle work to ⅛-in. dia and 4 in between centers.

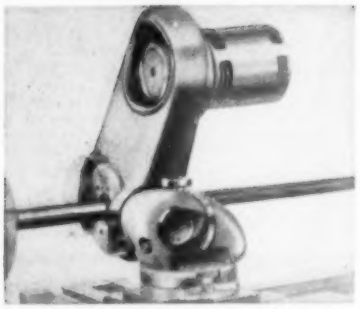
EXTERNAL THREAD ROLLER — *D H Prutton Machinery Co, 5295 W 130th St, Cleveland, Ohio.* Model 300 Rollmaster rolls Class-3-fit threads in ½ in.—13 hollow set screws of SAE 1035 steel at the rate of 19,440 pc/hr. Machine performs comparably on either hollow or solid work in a wide variety of metals ranging from nonferrous, through aluminum and magnesium, to hardened and stainless and other alloy steels.



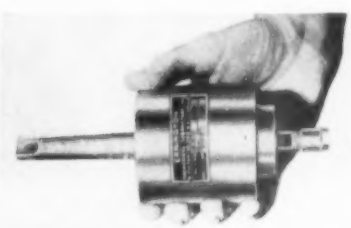
TAPPING HEAD—*Winslow Products Engineering Corp, 5420 Jillson St, Los Angeles 22, Calif.* This tapping head has been designed expressly for tapping 0-80 to 4-40 holes in steel or other material at high speed and with sensitive feel of the tapping operation.

TAPPING ATTACHMENT — *Eric S Johnson Co, 230 E Ohio St, Chicago 11, Ill.* Speed of the SPV tapping attachment is limited only by durability of the tap; it is possible to machine tap holes at a cutting speed of 300 fpm, and to tap blind holes in light metal at spindle speeds up to 2500 rpm.

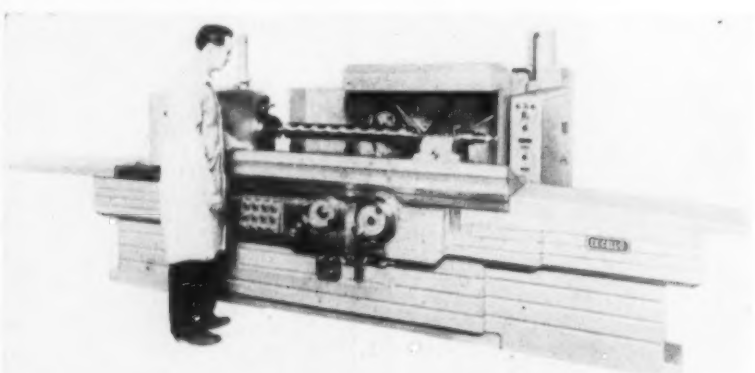
THREAD GRINDERS — *Kurt Orban Co, 205 E 42nd St, New York 17, N Y.* On four standard Lindner (Germany) thread grinders, lead tolerances can be held within 0.00008 over 1-in. length and within 0.00024 in. over 20 in.; pitch tolerances can be held within 0.0002 in. per in. Max. grinding dia is 9.84 in.



THREAD CUTTER—*National Threading Machine Co, 126 Market St, Paterson, NJ.* Cutting is done by means of a tool which moves around the workpiece eccentrically at high speed, in a single continuous operation. Unit cuts long standard V threads, Acme, Buttress and rounded threads, and, within close limits, modified square threads. They are said to be more exact in pitch than those produced under equal machining conditions on a twining basis. Cutting speeds are between 80 to 2000 fpm, depending on material worked.



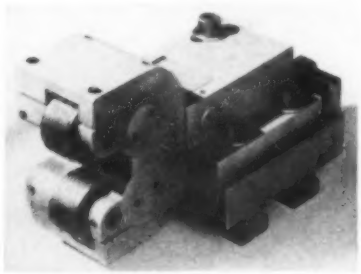
TAPPING CHUCK — *Errington Mechanical Laboratory, Inc, Staten Island 4, NY.* Small, compact, and light in weight. Has an oil-resistant Celeron cone and interchangeable shanks. Main spindle is supported at top and bottom by needle bearings. Available with collet chuck or Jacobs Rubber-Flex tap chuck.



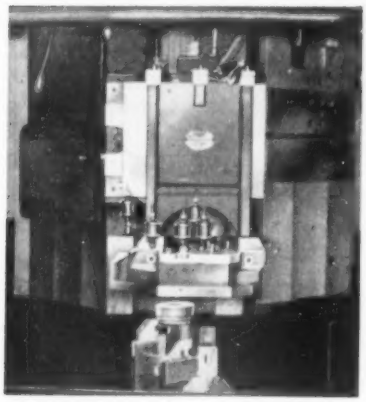
THREAD GRINDER—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Style-36 thread grinder is a large-capacity machine for grinding threads, worms, and other forms. It has the flexibility required for toolroom work, accuracy for thread and gage work, and automatic cycles to speed production grinding.

THREAD GENERATING MACHINE —*George Scherr Co, Inc, 200 Lafayette St, New York 12, NY.* New model of the Cornelis thread generating machine for cutting screw threads, lead screws, and worms is said to provide greater accuracy, better finish, and higher production than former models. Stepless spindle speeds from 60 to 900 rpm.

TAPPING ATTACHMENT—*Automatic Methods, 42 Walnut St Newark, NJ.* Auto-Tap, a lead screw tapping attachment, has a variety of split nuts and matching lead screws available in different pitches for a wide range of tapping requirements. Pitch variety ranges from 20 through 64.



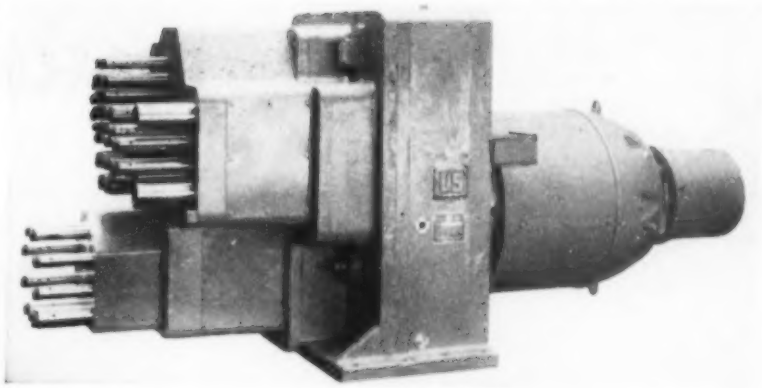
THREAD-ROLLING ATTACHMENT — *Reed Rolled Thread Die Co, 237 Chandler St, Worcester 2, Mass.* Series G2A thread-rolling attachment is used on automatic screw machines and turret lathes. Permits threading close to shoulders, and since rolling can be done on the collet end of the part, behind shoulders, a secondary operation is often eliminated. Class 2A and 3 American Standard and other similar threads may be rolled with this equipment.

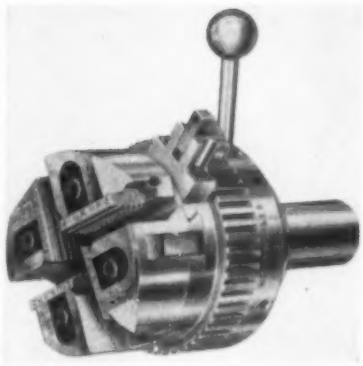


THREAD ROLLING ATTACHMENT —*Salvo Tool & Engrg Co, 26441 Gratiot Ave, Roseville, Mich.* These attachments which operate on the cross-turning slide of the Bullard Mult-au-matic roll large-dia threads in the normal cycle time. A 4¾-in.-12 thread can be produced on close-tolerance rocket parts.

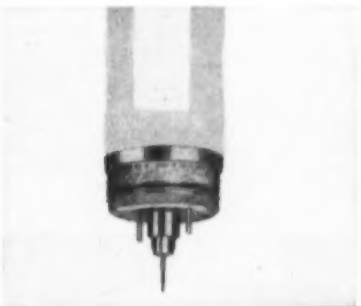
THREAD-ROLLING MACHINE—*Bell Equipment Co, 4439 Santa Fe Ave, Los Angeles 58, Calif.* It is claimed the Tsugami machine can be operated for fast mass-production of Class-3 threads by unskilled labor.

TAPPER — *Burg Tool Mfg Co, 3743 Durango Ave, Los Angeles 34, Calif.* Burgmaster tapper is claimed to be one of the smaller units with a large capacity for any type of drillpress. Range is No. 10 to ½ in. NF with two collets; collets are No. 10 to 5/16 in., and 5/16 to ½ in.





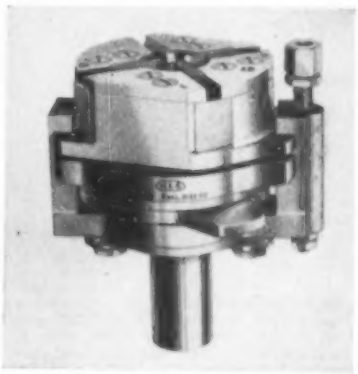
DIEHEAD — *Landis Machine Co, Waynesboro, Pa.* This diehead has a small number of working parts made of special alloy steel, hardened and ground. Known as the 5HH, it is stationary and self-opening with a range from No. 4 to ⅝ in. dia.



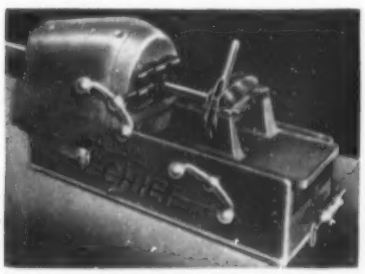
TAPPING CHUCK—*Commander Mfg Co, 4225 W Kinzie St, Chicago, Ill.* A finger-tip-control tapping chuck, designed for use with the Commander tapper, permits maximum use of tapper's spring clutch drive and adjustable torque control.

TANGENT DIEHEADS — *Jones & Lamson Machine Co, 7310 Woodward Ave., Springfield, Vt.* Developed for specific application to Brown & Sharpes. They are equipped with Dual-life chasers. Threading with the die heads can be done with speeds up to 3500 rpm.

38-SPINDLE LEADSCREW TAPPER —*U S Drillhead Co, Dept T, Cincinnati, Ohio.* Special tapping head was built to operate in conjunction with two additional leadscrew tapping heads in a three-way machine. The head can tap holes regardless of different threads, fine or coarse, small or large diameters.



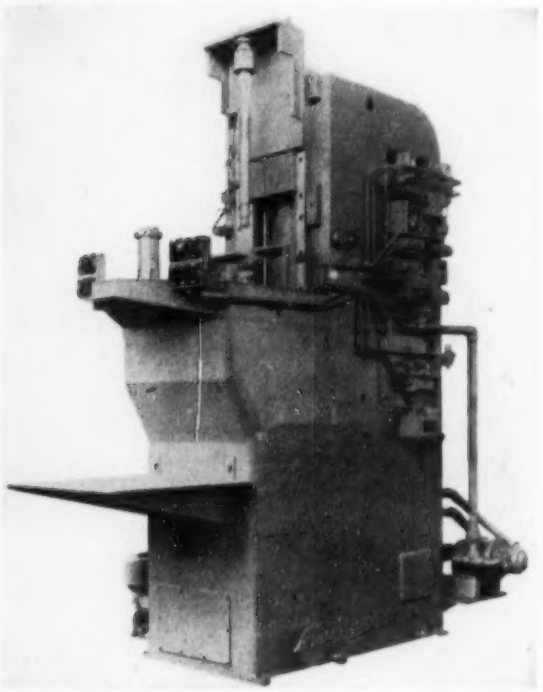
DIEHEAD — *The Eastern Machine Screw Corp, New Haven 6, Conn.* This aligning self-opening diehead is for Brown & Sharpe automatic screw machines, and any other machines where the diehead does not rotate. The diehead is available in four sizes in capacities from ⅝ dia. and 17/32 long up to 1 in. dia., ⅞ in. long.



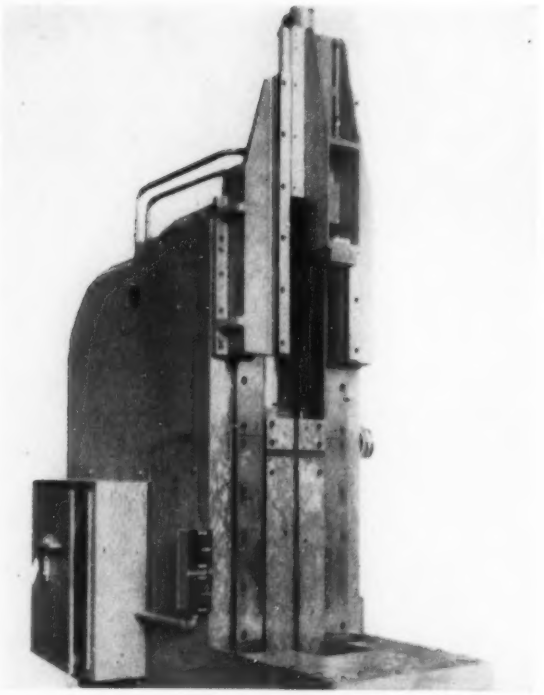
PORTABLE PIPE THREADER — *Quijada Tool Div, Gaines-Collins Co, 5474 Alhambra Ave, Los Angeles 32, Calif.* Patented power-operated chuck eliminates use of wrenches or other manual tools in handling the pipe. Four jaws automatically grip and center the work. Finger-tip control enables the operator to use the unit for making up, as well as threading, cutting, and reaming.

1953 American Machinist Production Preview

BROACHING

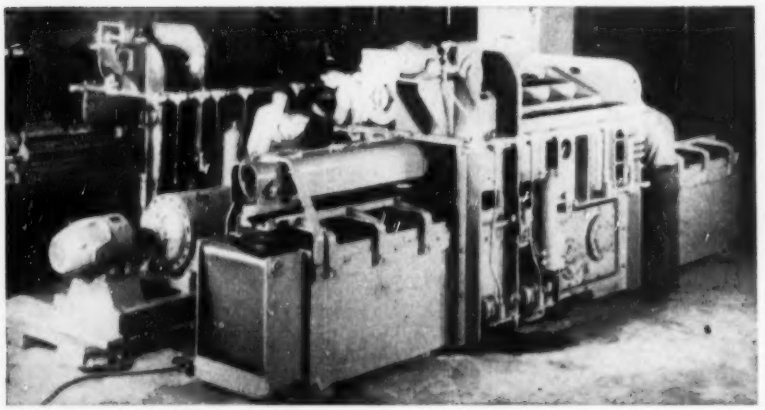


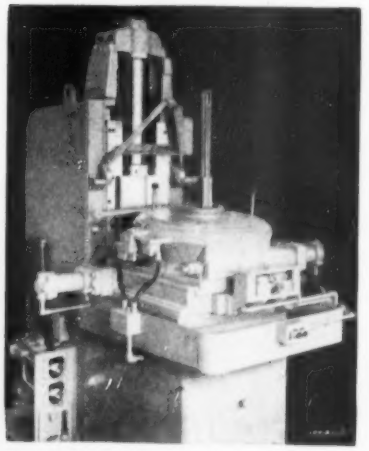
BROACHING MACHINE — *American Broach and Machine Co, 415 W Huron, Ann Arbor, Mich.* Equipped with interchangeable base fixtures and tooling for broaching the round and serrated holes in seven different tank arm and spindle parts. Stability has been built into the machine by having the machine slide and retriever slide move on the same ways.



BROACH RETRIEVER — *American Broach and Machine Co, Ann Arbor, Mich.* For three-way broaching machine, it is used to facilitate the handling of heavy broaches on pull-down operations.

HORIZONTAL BROACH — *Lapointe Machine Tool Co, Hudson, Mass.* Horizontal broach developed to cut anchor slots in jet rotor disks and turbine wheels at speeds below 50 fpm, but now redesigned to provide speeds above 150 fpm, with drives up to 200 hp. The frame is heavy and rigid to handle high-power, high-speed broaching, and strokes can be provided from 66 to 200 in.

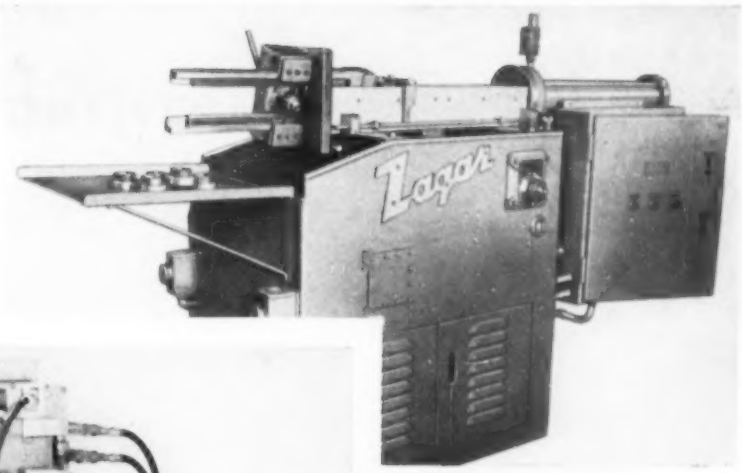




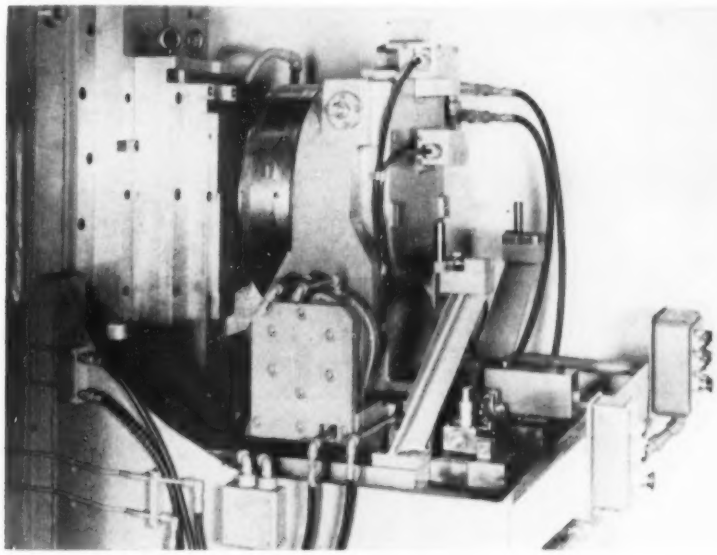
BROACH—*Colonial Broach Co, PO Box 37 Harper Station, Detroit 14, Mich.* Equipped with a special table and an adjustable shuttle travel it produces large tapered splines in tractor sprocket wheels of varying OD's. Operation is hydraulic with electrical control.

BROACHES SHARPENED—*American Broach and Machine Co, Ann Arbor, Mich.* An outstanding feature of this broach-sharpening machine is the mounting of the variable-drive headstock, intermediate steadyrests, and live-center tailstock on a stationary machine bed.

SURFACE BROACHING MACHINE—*American Broach and Machine Co, Ann Arbor, Mich.* A 72-in. stroke, 15-ton vertical hydraulic surface broaching machine is equipped with a fixed hydraulic cylinder to operate the work slide which is guided in adjustable hardened and ground ways. It is also available with 90- and 120-in. stroke.

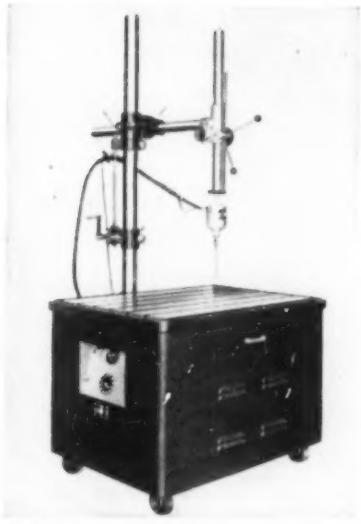


BROACHING MACHINE—*Zagar Tool, Inc, 2400 Lakeland Blvd, Cleveland 23, Ohio.* This 20-in. horizontal broaching machine is claimed to be the fastest available in both operation and strokes per hr. Maximum pull is 6000 lb; max feed stroke is variable between 2 and 27 fpm; full return stroke of 20 in. requires 1.5 sec. Cycles at 700 strokes per hr.



BROACHING—*Colonial Broach Co, PO Box 37, Harper Station, Detroit 13, Mich.* Tooling setup, coupled with a standard broaching machine produces 12 slots of identical shape on right- and left-hand 20-in.-dia stationary brake-applying cams for army tanks. The slots are not diametrically opposite each other and thus are in effect "blind". Broaching machine is a 6-ton, 42-in. stroke vertical.

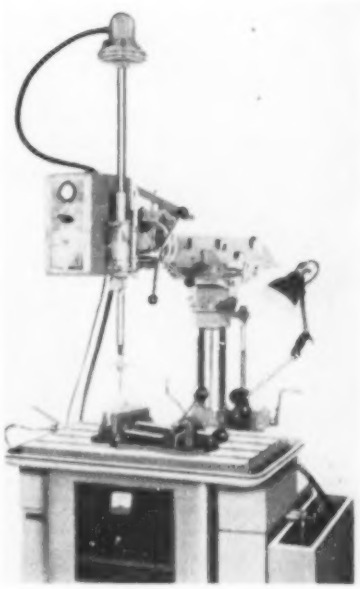
ELECTRIC-ARC MACHINING



BROKEN TAP AND DRILL REMOVER—*Electro Arc Mfg Co, PO Box 448, Ann Arbor, Mich.* Model 1-S metal disintegrator has the largest cast iron T-slotted ground workplate available on this type of equipment—28½ in. by 39½ in. This prevents large castings from hanging over side or end of the machine, and liquid coolant running on the floor.

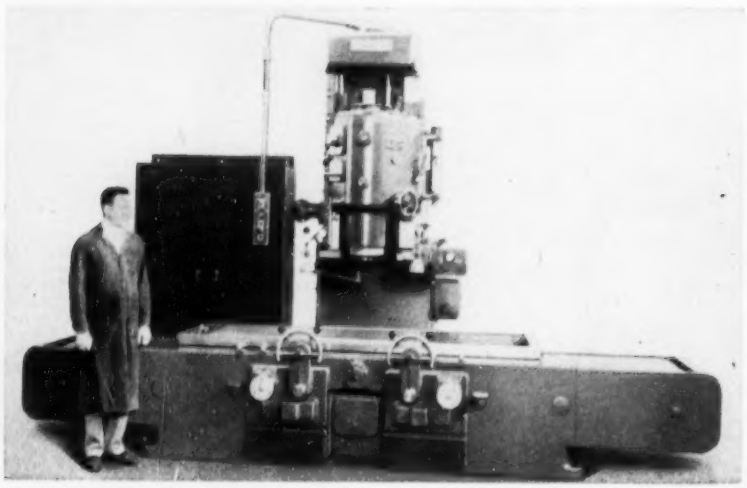
ELECTRON DRILL — *Elox Corp of Michigan, 749 N Rochester Rd, Clawson, Mich.* The M-300 electron drill performs the same work as the M-10 Tapmaster and in addition will cut holes as small as 0.030 in. It is adjustable for finishes ranging from coarse, fine, extra fine, and super fine. Feed is so sensitive that if a tiny particle of metal should create a short in drilling, the feed will back out rather than allowing the electrode to weld to the work.

DISINTEGRATOR—*Warner Div, Clinton Machine Co, Detroit, Mich.* The operator can easily take out the transformer and entire electrical section from the cabinet by simply removing four screws in the instrument panel. The transformer slides into position on channels. Known as the Model 952, it is designed to meet Underwriter's approval and standards.

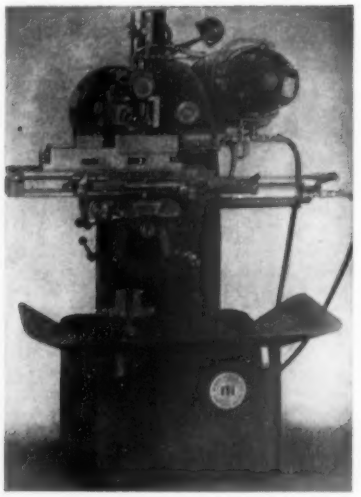


1953 American Machinist Production Preview

MILLING

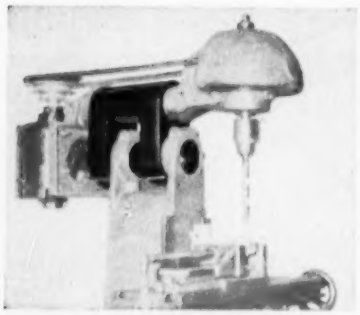


ELECTRONIC VERTICAL MILLER — *Reed-Prentice Corp, Worcester, Mass.* Pendant control provides instant pushbutton control of spindle movement and electronic feed power. Feed rates are infinitely variable; range is from ⅛ to 25 ipm. The No. 4 is offered in two sizes — the 60-in. model providing working surface of 24x96 in. and the 96-in. model with working surface of 24x132 in. Two GE electronic controllers provide full-wave rectification, armature control, reversing, overload, and undervoltage protection, armature voltage-drop compensation, and dynamic braking to bring the motor to a smooth, quick stop.



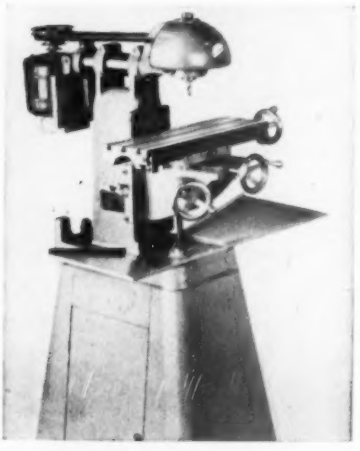
SEMI-AUTOMATIC MILLER — *Nicholas-Morris Corp, 50 Church St, New York 7, NY.* The air feed does not interfere with, but supplements the other methods of feeding the table by lever or screw. The unit consists of an air cylinder working in combination with a simplified hydraulic cylinder called Hydro-Chek. Full power stroke is 9 in., composed of rapid-approach and cutting stroke.

MILLING MACHINE—*Diamond Machine Tool Co, Los Angeles, Calif.* The Model 22M is claimed to have the rigidity, precision, and capacity of far larger machines. Longitudinal travel is 14 in., maximum vertical travel from center of spindle to table top is 15 in., and cross traverse is 5½ in.

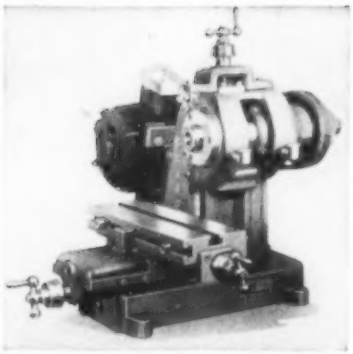


MILLING ADAPTER — *D W Price Corp, 11161 West Pico Blvd, Los Angeles 64, Calif.* Milling head of Benchmaster is raised by this adapter, increasing the height between table and spindle by 50%. The adapter also provides milling and drilling at angles up to 180°.

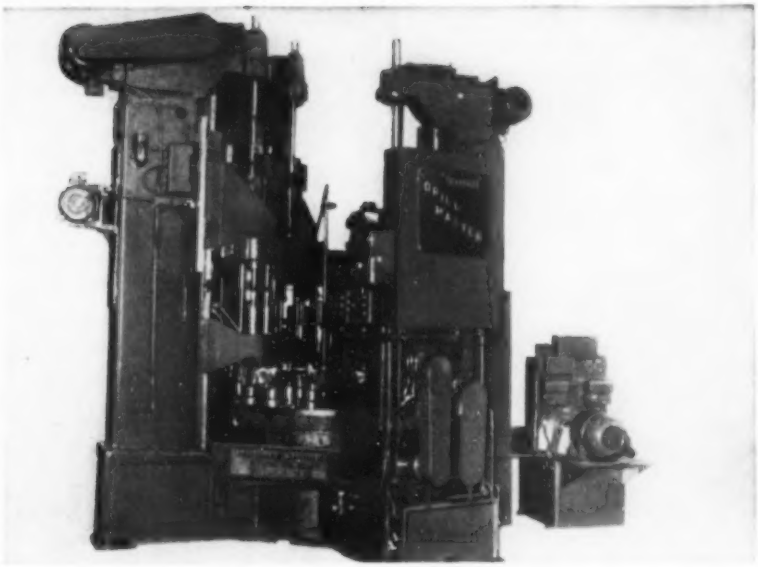
MILLING ATTACHMENT—*Arlington Industries, Inc, 79 Jefferson St, New York 2, N Y.* This Jason milling attachment will operate at any angle and will take up to ¾-in. end mill. Known as the Model 51, it is said to be both accurate and sturdy. Distributed by: Arlington Industries, Inc.



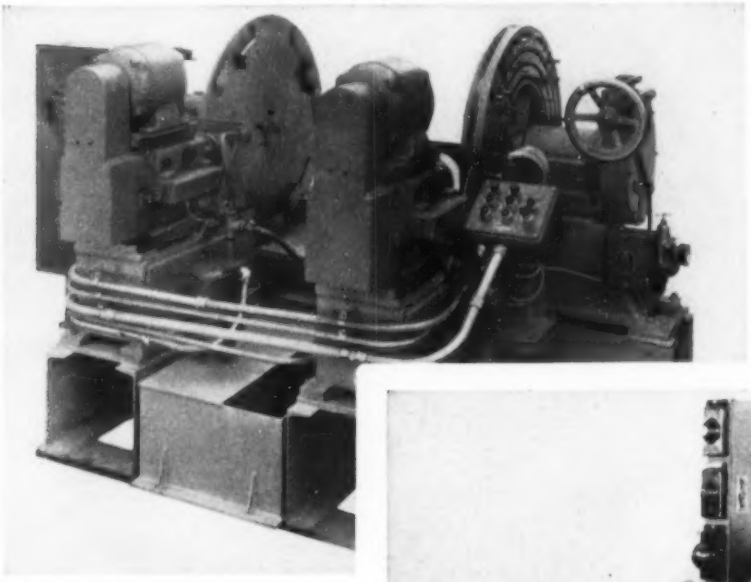
MILLER—*Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* Pedestal is table height, matches the base dimensions of the mill, and flares out at the foot to provide a secure mounting. The inside area accommodates the Benchmaster M-21 coolant system or can be used for storage area.



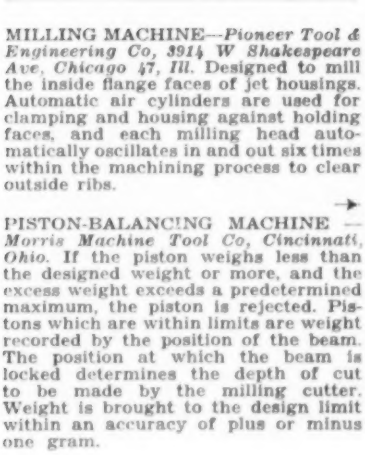
BENCH MILLER—*The Barker Engineering Co, 500 Green Rd, Cleveland 21, Ohio.* Toolroom model has three-way travel operated by micrometer feedscrews. Head travel is 3¼ in., table travel 5 in., and saddle travel 3 in. All travels can be locked. Table size is 4x12 in.



MILLING MACHINE—*Standard Machine & Tool Co, Ltd, Windsor, Ontario, Canada.* Drilling, reaming, and tapping holes; and inserting, reaming, and burnishing bushings on aluminum end frames for auto generators are done on this 5-column 7-station hydraulic machine.



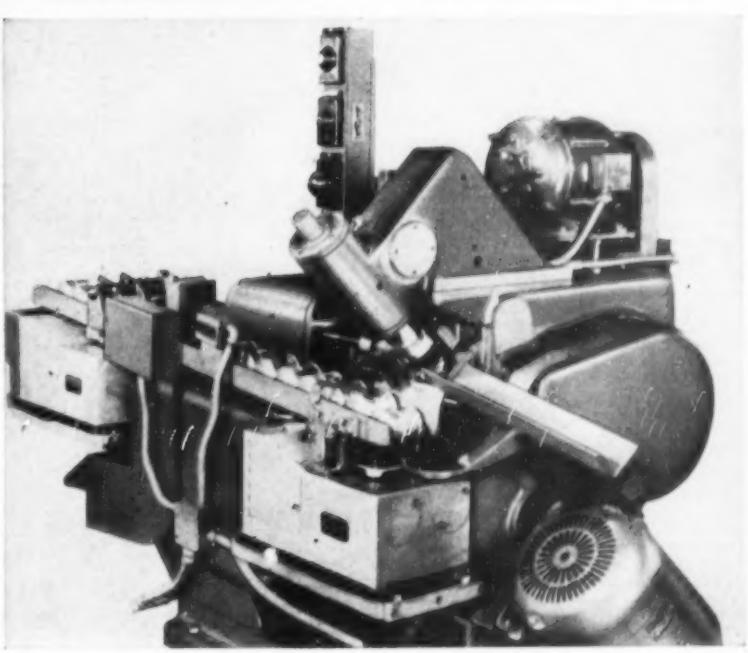
MILLER—*Eric R Bachmann, 27-11-41st Ave, Long Island City 1, N Y.* A protractor-shaped half circle on the Nothelfer (German-made) milling machine guides the head (motor, step-pulley and milling spindle) around a 90° arc. The head can be locked on the protractor guides in any desired position from vertical to horizontal.

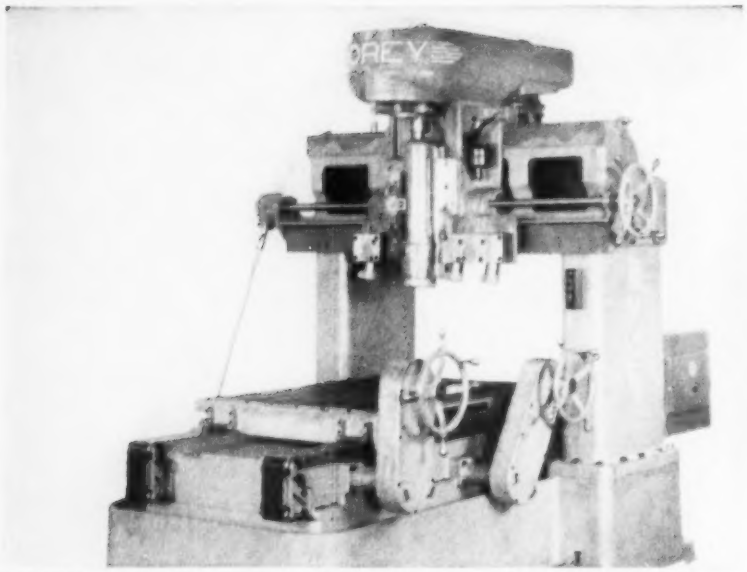


MILLING MACHINE—*Pioneer Tool & Engineering Co, 3914 W Shakespeare Ave, Chicago 47, Ill.* Designed to mill the inside flange faces of jet housings. Automatic air cylinders are used for clamping and housing against holding faces, and each milling head automatically oscillates in and out six times within the machining process to clear outside ribs.

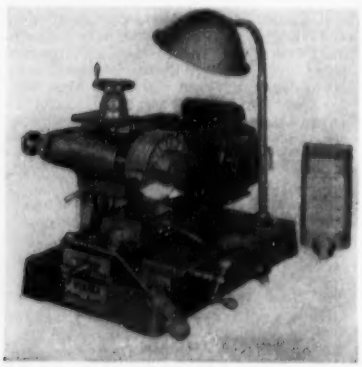
→

PISTON-BALANCING MACHINE — *Morris Machine Tool Co, Cincinnati, Ohio.* If the piston weighs less than the designed weight or more, and the excess weight exceeds a predetermined maximum, the piston is rejected. Pistons which are within limits are weight recorded by the position of the beam. The position at which the beam is locked determines the depth of cut to be made by the milling cutter. Weight is brought to the design limit within an accuracy of plus or minus one gram.



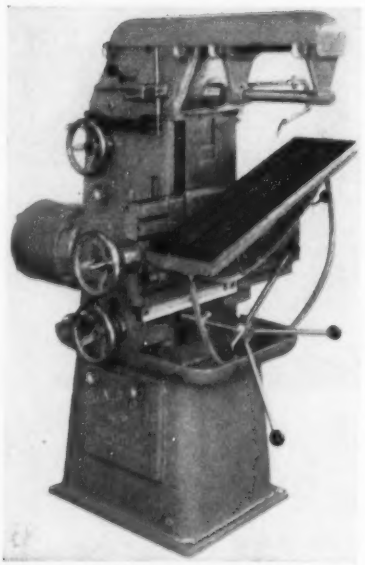


PROFILER-MILLER — *Morey Machinery Co, Inc, 410 Broome St, New York 13, N Y.* This machine provides a table 36x48x23¼-in. high to bridge and a maximum spindle speed of 4600 rpm. The 15-hp motor is two-speed and operates through a backgeared drive to provide low rpm as well. This machine is available in any table length and will be available with side head and also with a hydraulic-tracer attachment.

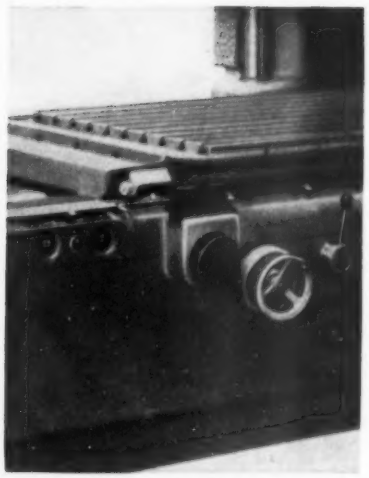


HYDRAULIC SPEED MILLS—*Viking Industries, 220 Montague St., Rockford, Ill.* The basic construction of Model 618 hydraulic speed mill, has been improved and strengthened by addition of the 2½-in. round steel overarm which provides extra rigidity to the cutter arbor. The outboard end of the overarm is supported by a heavy adjustable saddle and steel bracket.

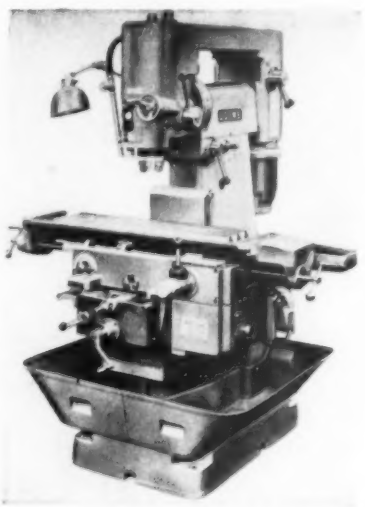
MILLING MACHINE — *Kurt Orban Co, Inc, 205 E 42nd St, New York 17, N Y.* Table sizes up to 80x20 in., table movement accuracy within 0.0004 in. and single-lever control are offered by this German-made vertical miller. It can be adapted to automatic cycling by trip dogs mounted on the front of the table. The vertical spindle head can be swiveled 45° in either direction and horizontal spindle can be used with an overarm for greater rigidity.



MILLING MACHINE — *Morey Machinery Co Inc, 410 Broome St, New York 13, NY.* The SABCA Model JRC2 miller has a table size of 30x9½ in. Vertical table size is 29½ in. x 11 in. Longitudinal table travel for both hand and power drive is 12½ in. There are 12 spindle speeds ranging from 48 to 2826 rpm.



JIG BORING, MILLING MACHINE—*American SIP Corp, 100 E 42nd St, New York 17, NY.* Viewing screens on which the graduation lines of the built-in standard scales are optically projected with a large magnification, are substituted for the former microscope eyepieces, thereby eliminating operator's eye strain and speeding up settings of SIP jig boring and milling machines Hydroptic 7P and 8P.

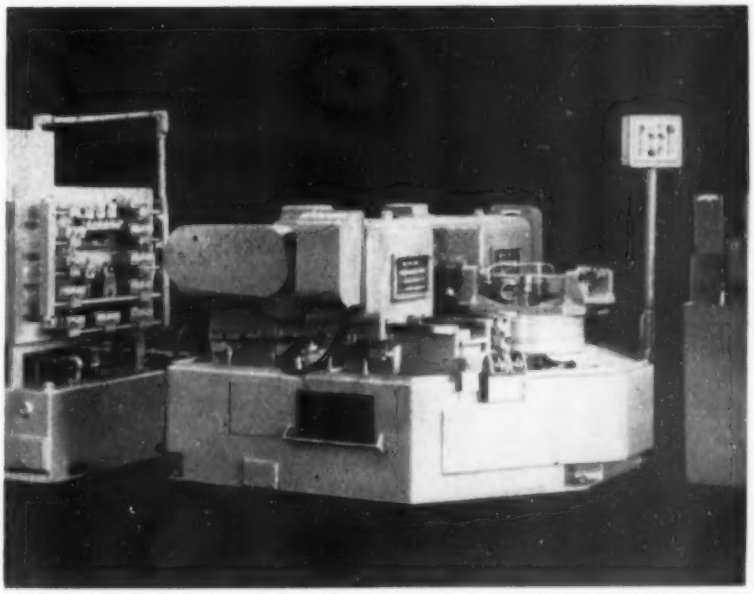


GERMAN MACHINE TOOLS—*Eric R Bachmann, 27-11 41st Ave, Long Island City 1 NY.* Complete line manufactured by Ludwig Loewe & Co, Berlin, Germany, include: lead screw and production lathes in various sizes; vertical, horizontal, and universal milling machines in three sizes, with single-lever controls; universal tool and cutter grinder; special reamer honing machine to allow a balanced load on all cutting edges of reamers; optical profile grinder with built-in comparator.

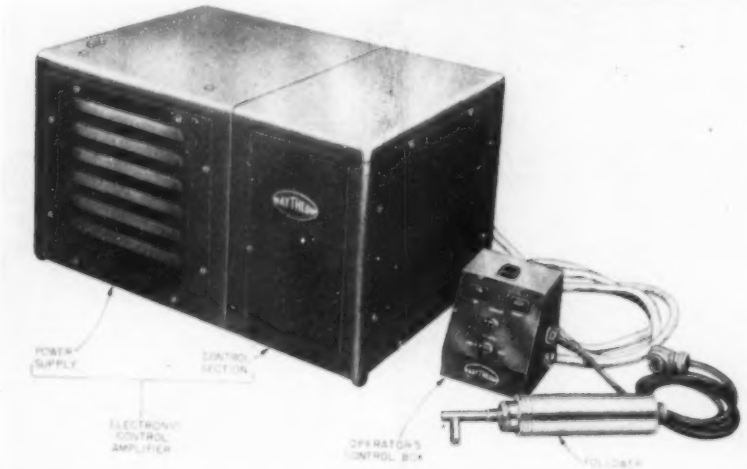
←

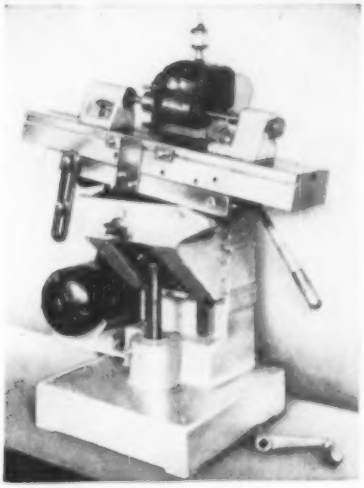
MILLING-MACHINE WAY PROTECTOR—*A & A Mfg Co, 2017 W Clybourn St, Milwaukee, Wis.* Accordion-action protector prevents chips, dirt, and abrasives from scoring, scratching, grooving, and cutting the ways. It is mounted permanently and folds automatically as the carriage is moved in either direction.

WEIGHT-BALANCE MILLING MACHINE—*The Motch & Merryweather Machinery Co, Cleveland*, Ohio. Removes enough metal from each end of an automotive connecting rod to keep the balance of the rod within 2 grams. It is made up of reciprocating table, rotating 180°, carrying two sets of work-holding fixtures, two opposed special quill-milling heads mounted on hardened ways, and a Toledo Scale unit housed in a floor-mounted cabinet.

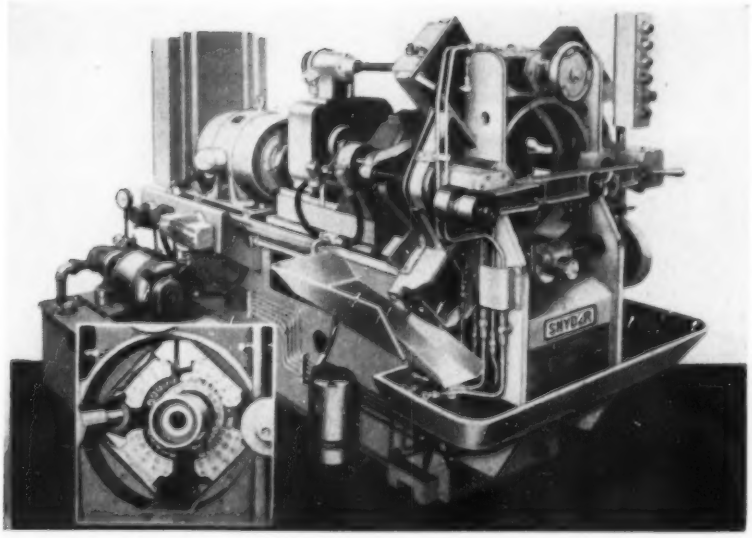


SINGLE-MOTION DUPLICATOR — *Raytheon Mfg Co, Waltham 54, Mass.* The single-motion duplicator is used in turning shafts, bearings, and similar parts of irregular contour. It has been used in die-sinking operation, and in producing cams of complicated design on milling machines.



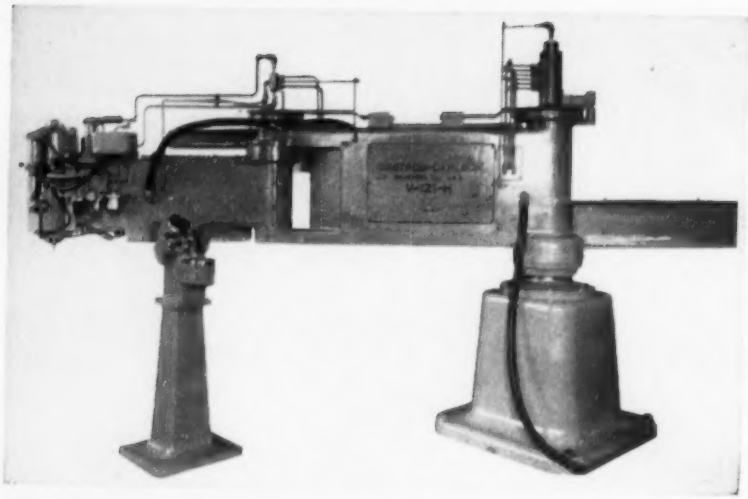


MILLING MACHINE—*Gay-Lee, Clawson, Mich.* Important features of this highspeed miller are: Parker Majestic spindle; heavy cast-iron frame; preloaded ball-bearing; table that tilts for better visibility; hardened and ground elevating screws; ½-hp motor with V-drive; and lube fitting throughout.



DUPLICATOR — *Tracer Control Co, 595 E Ten Mile Road, Hazel Park, Mich.* For use with either milling machines or lathes, this duplicator accurately controls two feeds and can reproduce, from templets, internal and external compound curves and 90° shoulders.

SPECIAL-PURPOSE MACHINE — *Snyder Tool and Engineering Co, 3400 E Lafayette, Detroit 7, Mich.* Back spot-faces 20 cylinder mounting holes and cylinder barrels and head assembly for radial aircraft engines. Cutters are mounted in four radially moving segments, each containing five cutters.



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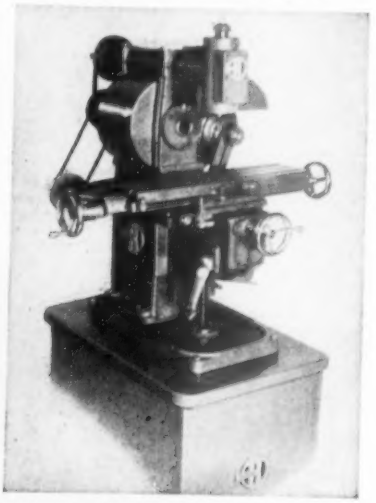
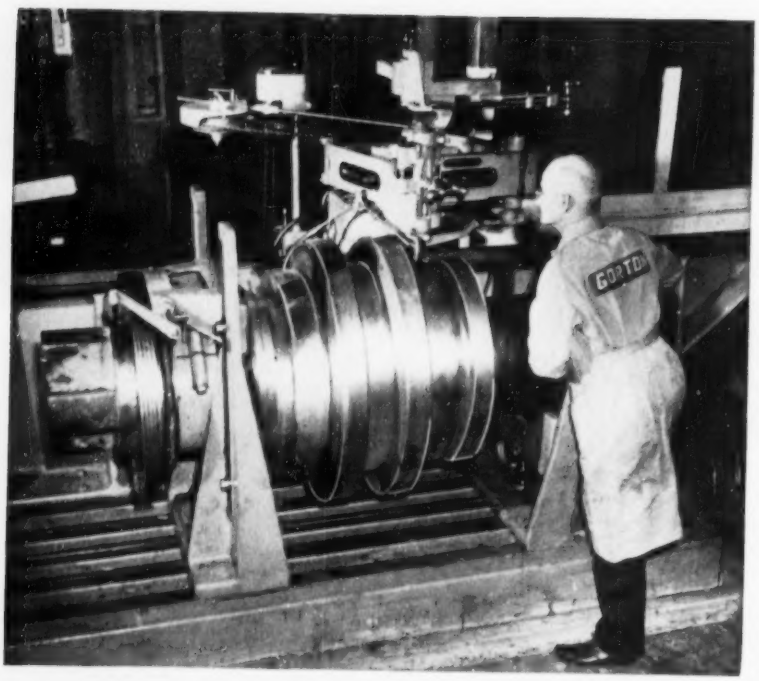
RADIAL ROUTER—*Ekstrom, Carlson & Co, 1400 Railroad Ave, Rockford, Ill.* Consists of a base, main turret, two hydraulic power-operated arm sections, a router head, remote-control station, a complete hydraulic panel, and the electric panel. High cycle current must be supplied to the head from an outside source. Feeding power is applied to each of the two arm sections by means of a hydraulic cylinder, rack and pinion. The cylinders and racks are intergal with the arms and the pinions are integral with the posts.



BENCH MILL—*Rotex Punch Co, 4726 E 12th St, Oakland, Calif.* Compact bench mill can accomplish work requiring a 12-in. length, 9-in vertical, and 5-in. traverse travel on its 5-in. by 20-in. table surface. Large-dia spindle supplied with a No. 10 B&S or No. 4 Morse taper, operates at 15 separate forward or backward speeds. Work is power fed at 0.003, 0.006, or 0.012 rpm.



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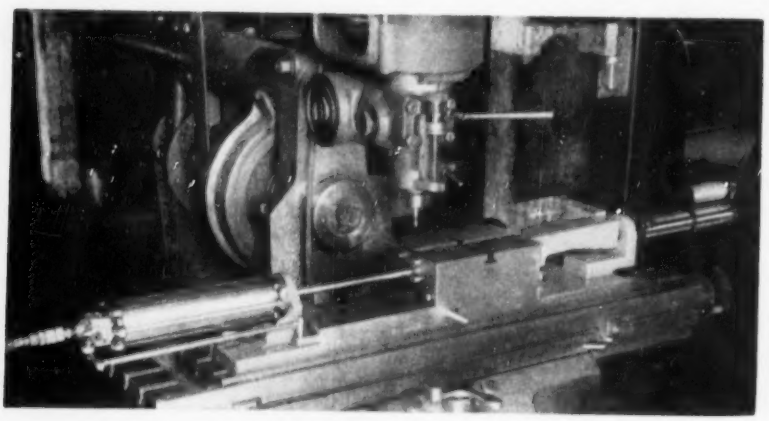
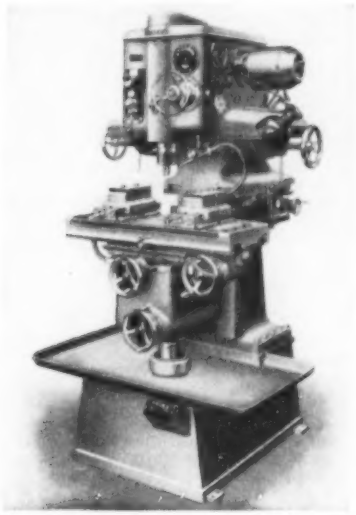
PANTOGRAPH ENGRAVING MACHINE — *George Gorton Machine Co, Racine, Wis.* Mills and engraves the surface of rolls up to 36 in. dia by 12 ft long which have been heat-treated to 50 Rc. Two-dimensional pantograph mechanism is attached and slides along dovetail way from one end to the other of the rail. Engraving on curved surfaces can be done using flat copy or master patterns.



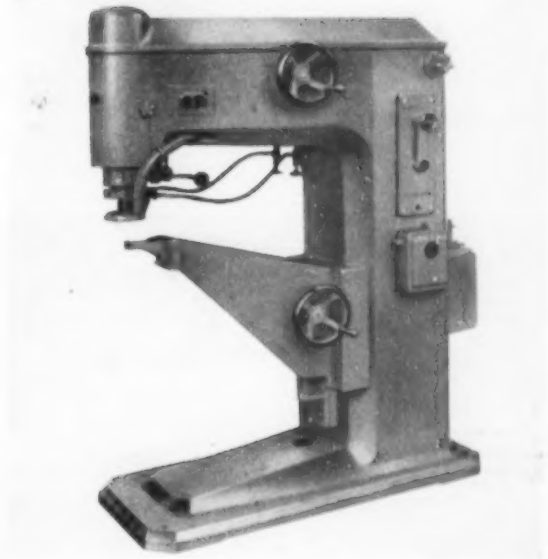
MILLING MACHINE—*Kurt Orban Co, Inc, 205 E 42nd Street, New York 17, NY.* Table working surface.....55x-14 in. Range, longitudinal.....39.3 in. vertical.....13.7 in., cross.....5.9 in. Jerwag milling machine is specifically designed for climb milling without special supports or accessories. It is claimed to use cutters at full speeds and feeds of which they are capable. A drum controller provides 6 progressive speeds for milling spindle in direct drive, 6 additional progressive speeds through back gears.

←
AUTOMATIC MILLING TABLE — *Glen Metal Products Co, PO Box 101, West Warwick, R I.* Any milling machine can be made automatic over the period of one cycle by this unit. An infinite number of cycles is obtainable within its stroke—fast feed to the cutter, slow feed through the cutter, and rapid return. There are two sizes: the No. 0 which has a 6-in. stroke, and the No. 1 with 9-in. stroke.

MILLING MACHINE—*Cosa Corp, 405 Lexington Ave, New York 17, NY.* A versatile, well-built milling machine for single part, series and mass production work is available in plain, universal, or vertical models. Clamping surface of work table is 11¾x39¾ in. or 11¾x49¼ in. The longitudinal table traverse is 28 or 38 in. Number of spindle speeds is 16, number of feeds 19 in different ranges.



HYDRAULIC VERTICAL MILLER—*Ernest Gottschalk Co, Inc, 401 Broadway, New York 3, NY.* Can be used for the automatic milling of keyways, slots, grooves, etc. Because of its finely graduated collars and accuracy, it is also suitable for tool, die, and fixture work. The cross-movement of the cutting tool is accomplished by a handwheel with a collar graduated to an accuracy of 0.0004 in. This cross-movement makes the width of a keyway independent of cutter dia.



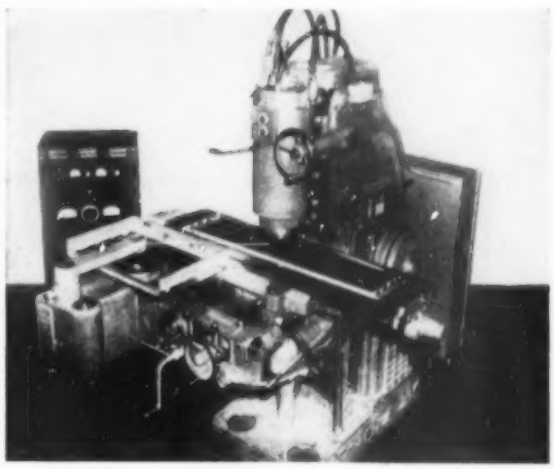
HORN ROUTER—*Ekstrom, Carlson & Co, Dept M-1, 1400 Railroad Ave, Rockford, Ill.* ECCo 434H horn router is particularly useful for many types of trim routing operations in non-ferrous metals requiring an unusually great swing clearance. It can be equipped with either 3-, 5-, or 7½- hp, 3600-rpm drive motor. Spindle speeds of either 10,000 or 20,000 rpm are easily and quickly obtained through a two-step drive pulley arrangement.

←

PROFILING MACHINE—*The Wade Tool Co, Waltham, Mass.* This redesigned profiler is now much heavier, and has a more powerful V-belt drive. New cutter-holding collets have improved grip. The machine can do profiling, milling, slotting, recessing, and routing on a great variety of small mechanical parts.

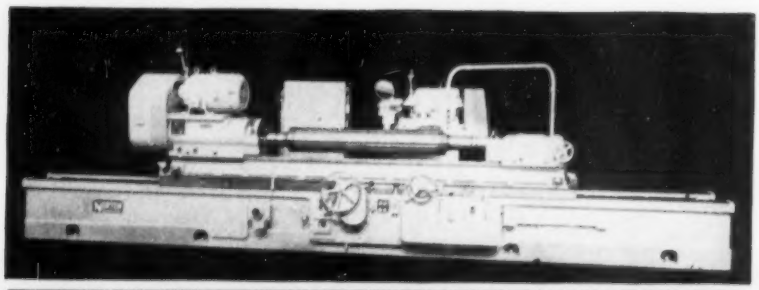
→

MILLER—*Kearney & Trecker Corp, 6784 W National Ave, Milwaukee 14, Wis.* Knee-type contour-copy milling machine has three advantages: (1) Three models, all of which can be used as standard milling machines. (2) Especially valuable when machining non-ferrous metals, since feed rates up to 100 ipm can be obtained. (3) An optical sensing method is employed whereby opaque paper patterns can be used with advantages in ease of manufacture and storing.

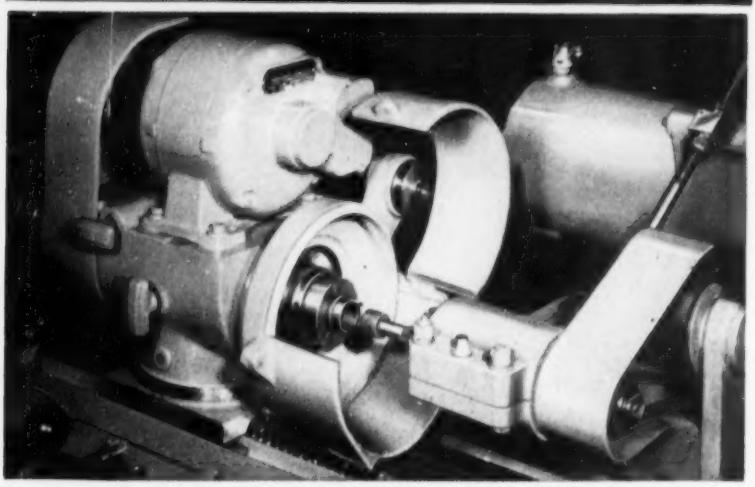


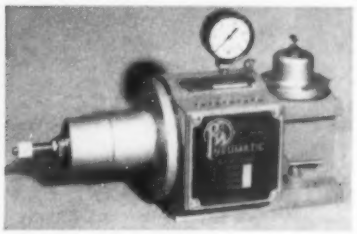
1953 American Machinist Production Preview

GRINDING, HONING, LAPPING

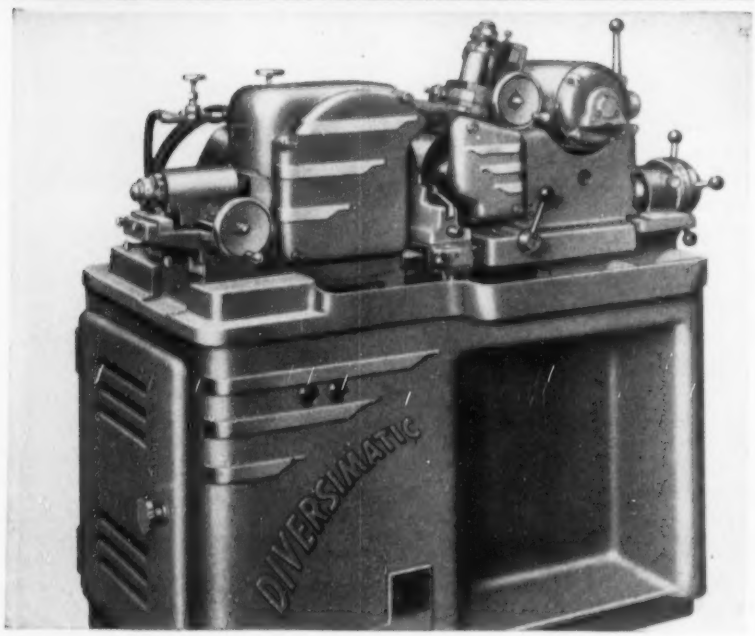


CYLINDRICAL GRINDER — *Norton Co, Worcester 6, Mass.* Type-C2 cylindrical grinder is built as a plain or semiautomatic machine in 18, 24, or 30-in. swing, and in work lengths of 48, 72, 96, 120 144, or 168 in. Wheel feed handwheel and "click-count" indexing mechanism indicate amount of feed as wheel is rotated past a fixed pointer, permit settings of 0.0001 in. without visual attention.





INTERNAL-GRINDING — *Pratt & Whitney Div Niles-Bement-Pond Co, W Hartford 1, Conn.* Two units cover the wide speed range of 35,000 to 1000 rpm. This range provides the most efficient cutting speed (approximately 5,000 sfpm) for grinding wheels or points ranging from 5/32 to $\frac{3}{4}$ in. in dia. One of the features of these heads is their ability to operate under grinding load with very small droop from the preset idling speed.

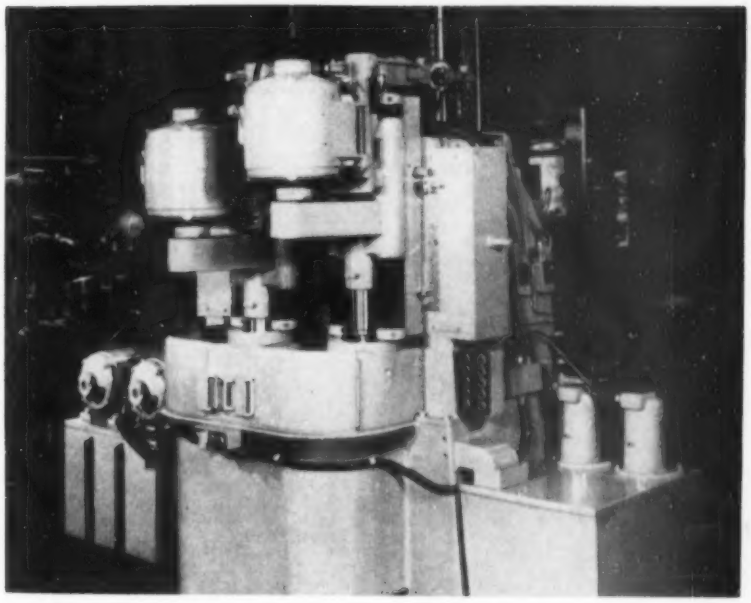


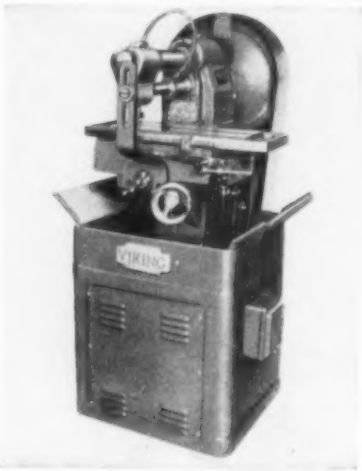
INTERNAL-EXTERNAL GRINDER —*Rivett Lathe & Grinder, Inc, Boston, Mass.* The Model-84 grinds holes from very small up to 3-in. dia. with a maximum 4-in. depth depending upon the dia. It grinds externally up to 3 in. dia with a length of 4 in. Interchangeable motor-driven wheelheads for external and internal spindles can be selected for the job—with removable arbor, with chuck for mounted wheels, or with solid shaft.

JET-BLADE GRINDER—*Norton Co, Worcester 6, Mass.* Compound-contour jet-blade grinder is equipped with cam-controlled stub arbors, special workholders for two or three jet-engine blades, and automatic hydraulic wheel dressing. Wheel speed is 6500 sfpm, and fixture rotation is at 15 rpm.

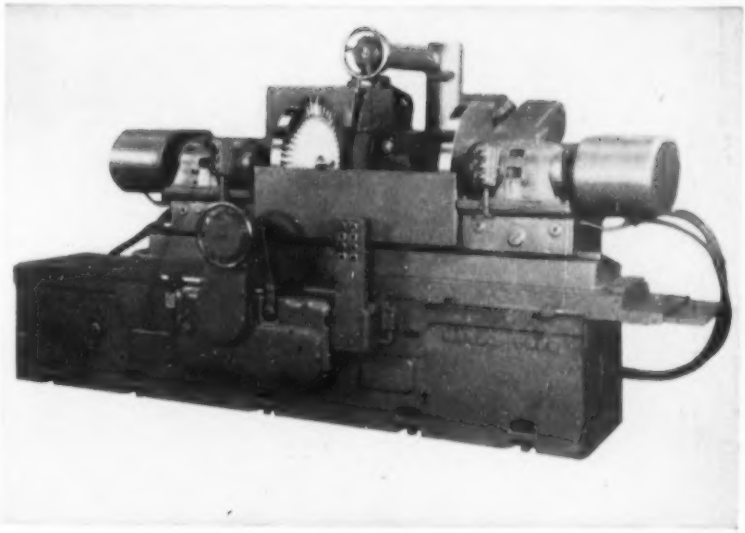
CENTERLESS GRINDER — *Diversified Metal Products Co, 5138 Alcoa Ave, Los Angeles 58, Calif.* Grinder features a cool-running spindle which maintains tolerance with no warm-up period before starting the days' operations. It employs a 14x14-in. grinding wheel, and a 7x4-in. regulating wheel. The feed-wheel speed range is infinite from 30 to 350 rpm. Known as the Diversimatic.

→ VERTICAL GRINDER—*The Springfield Machine Tool Co, Springfield, Ohio.* Individually operated and controlled spindles. Self-centering centrifugal chuck. Left-hand spindle may be in operation while the right-hand head is retracted for unloading and loading. As the table begins to revolve, the centrifugal force causes the jaw to grip the work firmly throughout the grinding cycle.

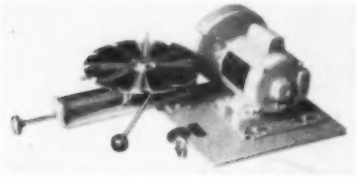




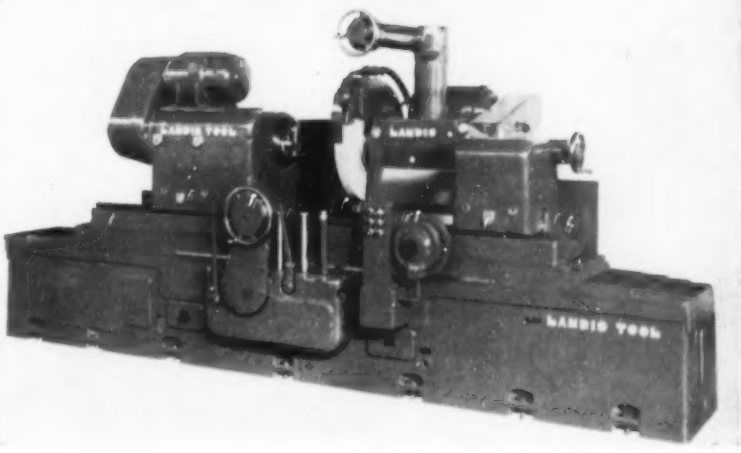
SURFACE GRINDER—*Viking Industries, 220 Montague St, Rockford, Ill.* This bench-type precision surface grinder features an extra heavy headstock, micrometer adjusting dials, precision spindle for fast precision work on small parts. Machine is powered by a 1/3 hp continuous-duty dual-voltage motor, and is designed for mounting a 4-in. -dia wheel.



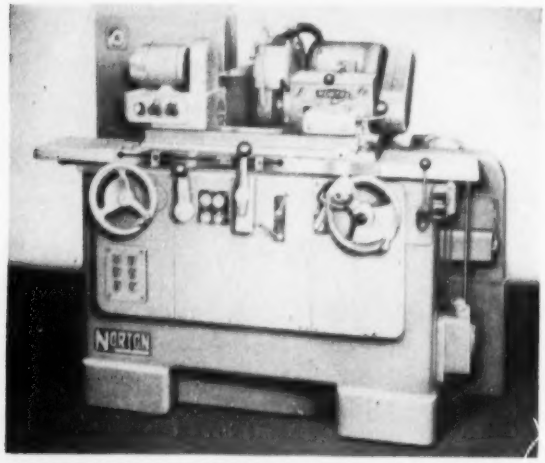
→ CYLINDRICAL GRINDER — *Landis Tool Co, Waynesboro, Pa.* Grinds blade tips of jet-engine rotors using twin headstocks with hydraulic chucking. A complete jet rotor may be put in grinding position on one headstock, while another rotor with blades is being ground. This operation finish grinds the blade tips to an exact dimension. Grinding wheel is 30x3x12 in.



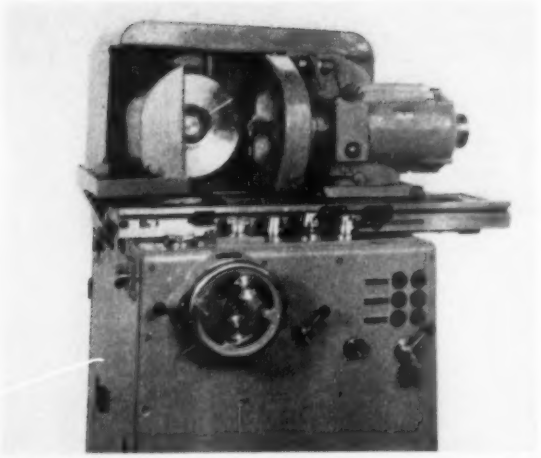
CIRCULAR-SAW SHARPENER — *Hanchett Manufacturing Co, Big Rapids, Mich.* Designed for wide-tooth-spaced, saws, the Easy Cut sharpener generates the correct tooth shape with uniform, sharp teeth. Capacity for saws from 6 to 24 in. in dia.



→ GRINDER—*Landis Tool Co, Waynesboro, Pa.* CHW provides a cylindrical grinder for parts of large diameter, or with projections. It is available in 30-, 36-, and 48-in.-dia swings. Lengths between centers are 48, 72, 96, and 120 in. A 10- or 15-hp motor is used to drive the 30-in.-dia grinding wheel.



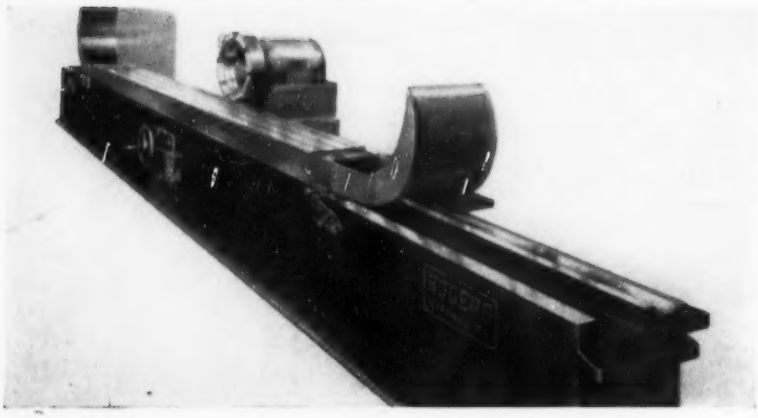
CYLINDRICAL GRINDERS—*Norton Co, Worcester 6, Mass.* This 4-in. Type CTU cylindrical grinding machine is available as a plain machine, or as a semi-automatic in work-length capacities of 12 or 18 in. The machine provides extra operating ease. Wheel feeds and job setups are simplified by a graduated wheel-feed handwheel.



DOUBLE-SPINDLE GRINDER — *Gardner Machine Co, Beloit, Wis.* For grinding parallel sides of steel or bronze-faced clutch plates. Plates ranging from 12½ to 19-in. dia and measuring 0.126-in. thick can be handled. Production averages 35 to 40 per hr, removing 0.010-in. over-all stock.

FACE GRINDER—*Kurt Orban Co, Inc, 205 E 42nd St, New York 17, N Y.* In this Reinecker rotary face grinder (Germany), both the work spindle and the grinding spindle can be tilted around their vertical axis. The work can be chucked within a range of ½ to 10-in. dia. to 6 in. in height by magnetic, collet or jaw chucks.

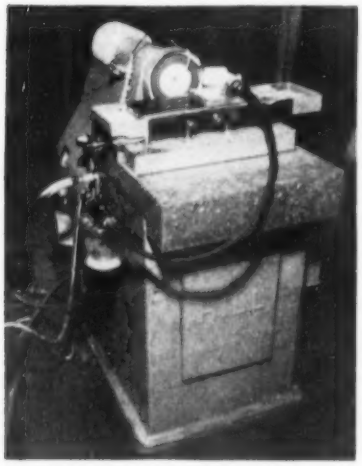
GRINDING UNIT—*George F Grant Co, Inc, West Newton 65, Mass.* Employing the contact-wheel method of coated abrasive-belt polishing, this unit also features platen-supported belt grinding, concave and convex contour grinding and polishing, and ¼- to ½-in. radius grinding and polishing, plus internal grinding attachments capable of doing areas from ⅝ up to 2 in. ID.

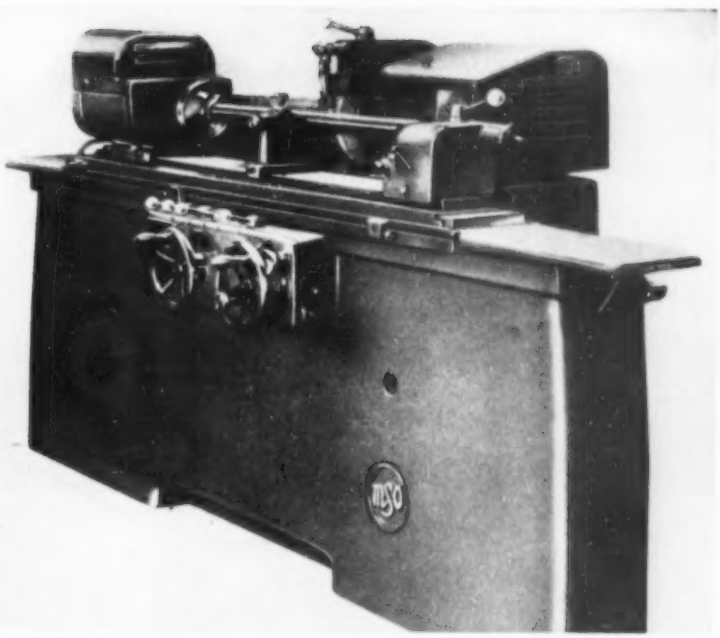


GRINDER—*Whitnon Mfg Co, New Britain, Conn.* These ball-bearing spindles are easily installed by loosening the hand screws and removing the old bronze bearings and shaft assembly on Brown & Sharpe Universal Grinders. The preloaded bearings are extremely rigid both axially and radially.

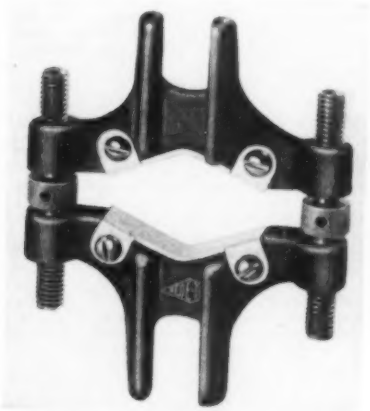
FACE GRINDER—*Samuel C Rogers & Co, 183-210 Dutton Ave, Buffalo 11, N Y.* Three table-drives are available. Constant- and variable-speed motor drives with table rates up to 100 fpm and a hydraulic drive with speeds up to 150 fpm. Known as Series 250, there are six standard models (38, 60, 90, 120, 140 and 180 in.) with intermediate sizes available on special requests.

CYLINDRICAL GRINDERS — *Albert Klingelhofer Machine Tool Corp, Westfield, NJ.* A new line of infeed grinders (Germany) can do longitudinal grinding with hand or power infeed and have quick return traverse of the wheelhead controlled by an adjustment of the main operating lever.



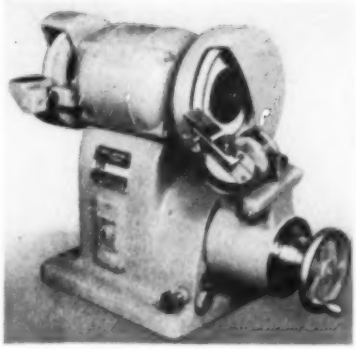


FACE GRINDER—*H M Hill Machine Works, 98 Schor Ave, Leonia, N J.* Automatic face grinder or lapping machine has a variable-speed, hydraulically-operated table for accurate work motion. A hydraulic infeed provides constant pressure against the wheel. Table stroke, 6 in.; Saddle stroke, 4½ in.; Length of table, 26 in. The spindle is XLO motorized—1 hp, 3,450 rpm.



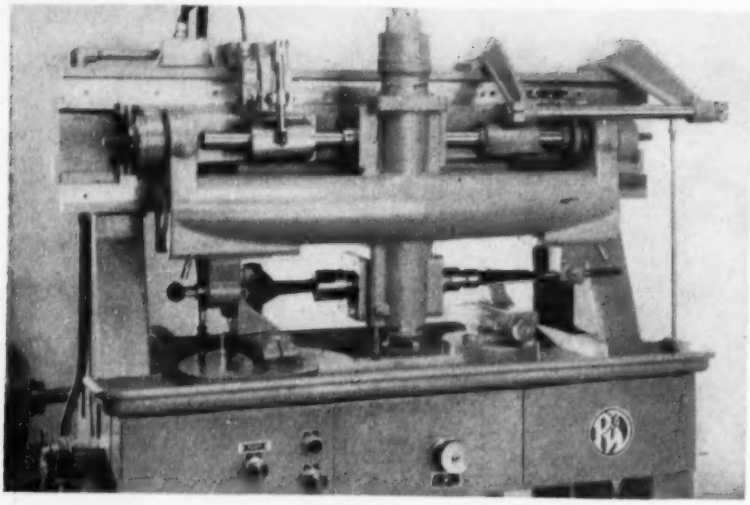
GRINDER DOG—*Ready Tool Co, 55½ Iranistan Ave, Bridgeport 5, Conn.* Red-E universal grinding machine dog has a brass face design claimed to eliminate marring and damaging of soft, finished, or threadwork. When the dog is opened to greatest capacity, drawing pins in the face plate will not come in contact with the bottom of the slot.

DIE-CHASER SHARPENER — *Jones & Lamson Machine Co, Springfield, Vt.* Equipped with the J'L chaser grinding fixtures and adapters, it can be used on both tangent and radial chasers. Adapters for J&L chasers are available from stock, and other make adapters can be easily applied to the fixture.

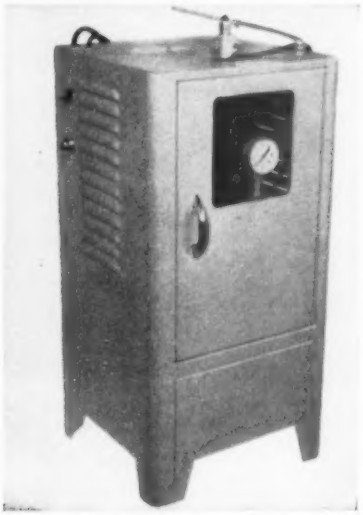


CENTERLESS GRINDER — *Diversified Metal Products Co, 5125 Alcoa Ave, PO Box 362, Los Angeles 58, Calif.* Diversimatic No. 1 centerless grinder has been superseded by the No. 1-R. Stock diameters can now range from 0 to 1½ in. Due to increased ruggedness and capacity, the machine is recommended for operation with 5-hp motor only.

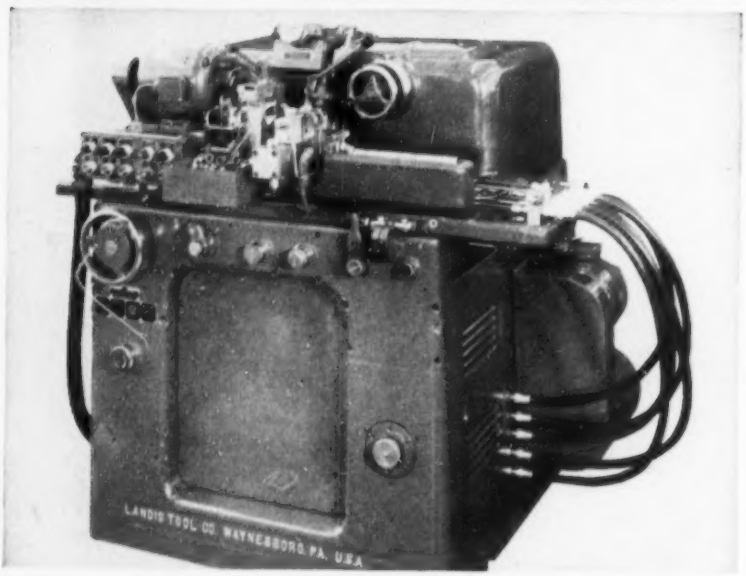
CRUSH DRESSING — *Diversifield Metal Products Co, 5125 Alcoa Ave, Los Angeles 58, Calif.* Crush dressing unit is now available on the Diversimatic centerless grinder. Process utilizes a precision ground roll of desired profile which is crushed against and imparts its shape to the grinding wheel.



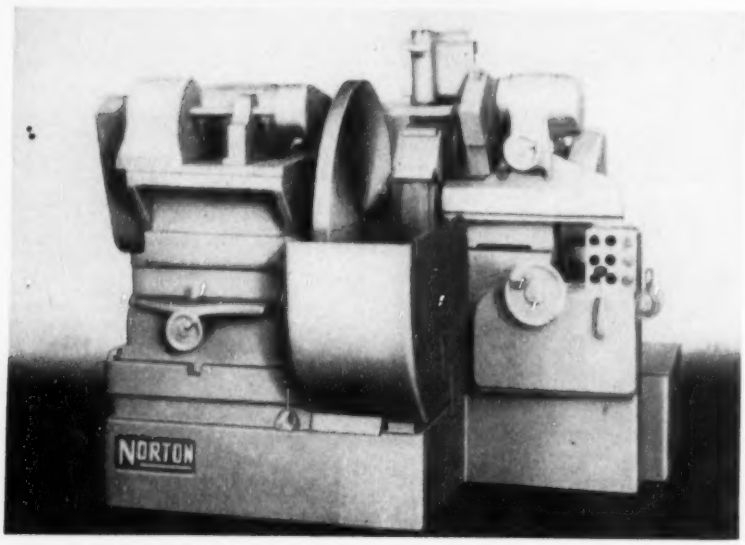
BLADE GRINDER—*Pratt & Whitney, Div Niles-Bement-Pond Co, W Hartford 1, Conn.* Belt machine grinds the complete airfoil section in a single automatic cycle. One operator, tending a battery of machines, has only to unload the finished blade, load a forged or fabricated blade blank and restart the cycle. A roughing pass removes from 0.002 to 0.006 in. on a side per traverse; a finishing pass 0.001 in. per side.



GRINDING ATACHMENT — *Reid Brothers Co, Beverly, Mass.* Spray cooling of work with this attachment permits wet grinding on toolroom grinders without guards around the work or a flow of coolant over the work. Motor compressor and coolant container are mounted in a 16x16x32-in. cabinet.



AUTOMATIC GRINDER—*Landis Tool Co, Waynesboro, Pa.* Work such as antifriction bearing races or rings for precision mechanisms can be OD ground within extra close limits for concentricity because of a new method of work holding in 4-in. concentric grinder. Cycle is automatic. The 16-in.-dia grinding wheel is driven from a 3-hp motor.

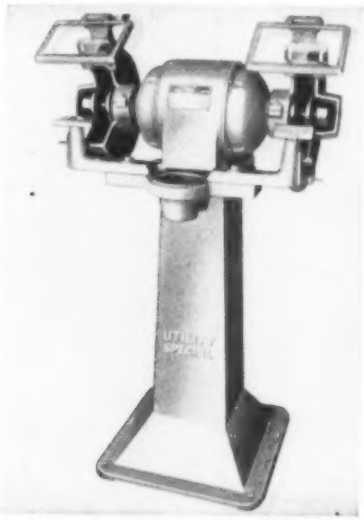


CONTACT WHEEL—*The Carborundum Co, Niagara Falls, N Y.* The Carborundum universal hub contact wheel is a three-part bolted assembly, consisting of a flanged universal hub, a T-61 serrated rubber tire, and a side plate. A worn-out tire is discarded and replaced by a new tire at half the cost of a whole new contact wheel.

CARBIDE-TOOL GRINDER—*H E B Machine Tools, Inc, 341 Madison Ave, New York 17, N Y.* This grinder can handle all types of carbide tools, however complicated their profile. There is only one attachment needed and that one is only for grinding carbide inserted-tooth milling cutters.

GRINDER—*The Norton Co, Worcester 6, Mass.* Here is a machine with special features for grinding jet-engine compressor wheels or similar work. Face plates, chucks, or other workholding fixtures can be conveniently mounted on the workhead spindle. Maximum work capacity is 42 in.

BLADE GRINDER—*Ex-Cell-O Corp, Detroit 32, Mich.* The Ex-Cell-O 84 grinds flat, grooved or curved surfaces on the roots of jet-engine compressor blades and turbine buckets; machining cycle is fully automatic.



PEDESTAL GRINDER — *Reuland Electric Co, Alhambra, Calif.* Line of pedestal grinders, buffers, and sanders, uses the company's own motor and is, therefore, claimed to be inexpensive.

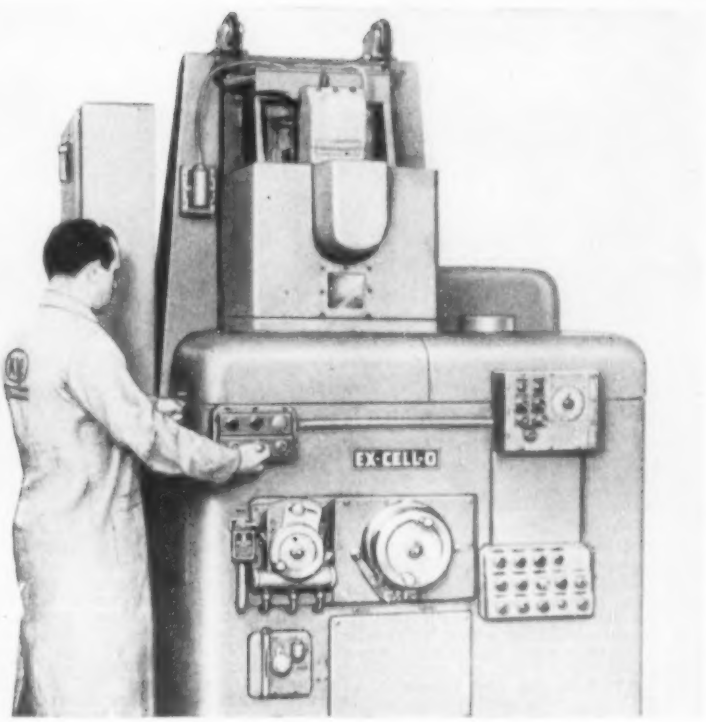
SURFACE GRINDER—*Boyar-Schultz Corp, Walnut St, Chicago, Ill.* Model No. 6-12 has an improved lubrication system for the table ways. The reservoir for holding the oil is located in the center of the table. It is fed from a single oil cup located in the front, thus eliminating eight separate cups.

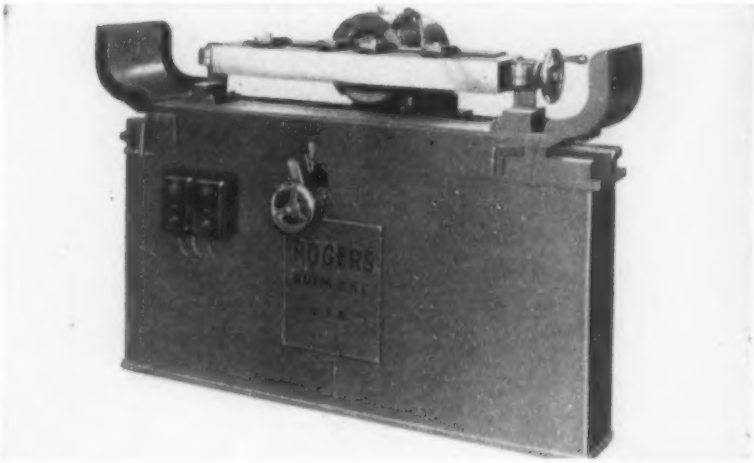
SINE CHUCK—*Magna-Lock, Inc, Dept 100, Big Rapids, Mich.* Permits precision angular setups on surface grinders in a few minutes. Gage blocks required for a particular single-angle or compound-angle are determined from a table of constants provided.

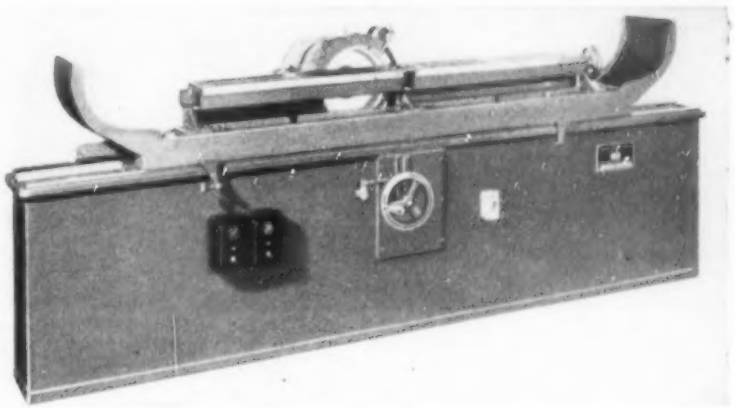
LIGHT-DUTY GRINDER—*Samuel C Rogers & Co., 193-210 Dutton Ave, Buffalo 11, N Y.* Combines speed and low-cost for grinding woodworking, paper cutting, and other straight knives. An index is included for bevel grinding. It is produced in four sizes—32-, 38-, 48-, and 60-in.

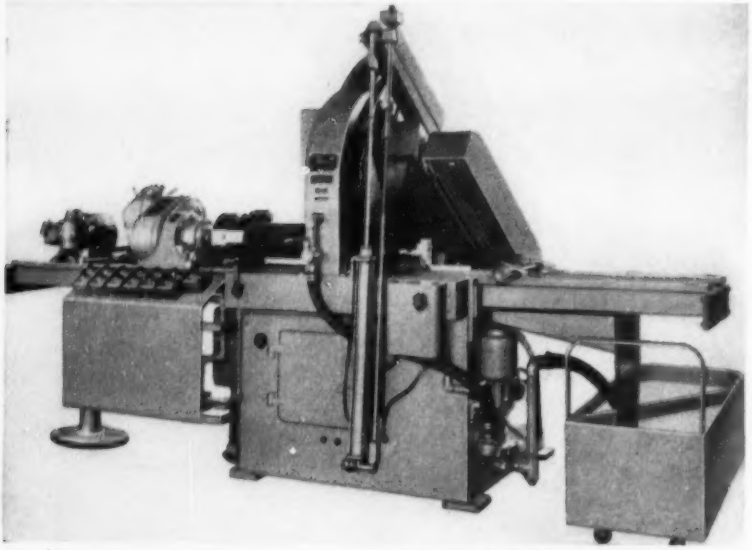
GRINDER—*Samuel C Rogers & Co, 183-205 Dutton Ave, Buffalo 11, N Y.* Adaptable for fast blade grinding, but can also be used for flat face, bevel, and edge grinding. Equipped with magnetic table chuck 8x184-in. Hydraulic motor drive moves the work past the grinding head at speeds up to 100 fpm. The segmental grinding wheel is driven by a 25-hp heavy-duty ball-bearing motor.

AUTOMATIC KNIFE GRINDER — *Samuel C Rogers & Co, 183-205 Dutton Ave, Buffalo 11, N Y.* Has electric table drive, including special control switches and 1½-hp reversing motor. The wheel is a 14-in.-dia segmental and is moved to the work automatically in desired increments. Available in 6 standard sizes to handle knives up to 60, 66, 72, 90, 102, and 110 in. in length.



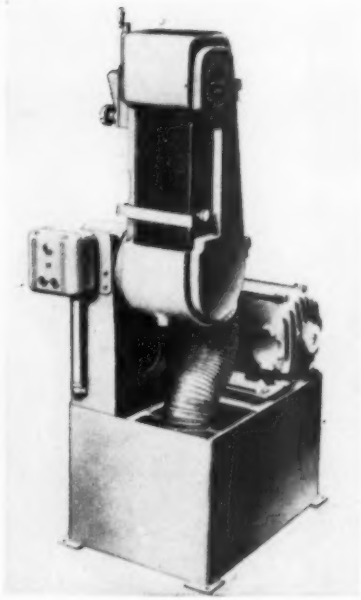




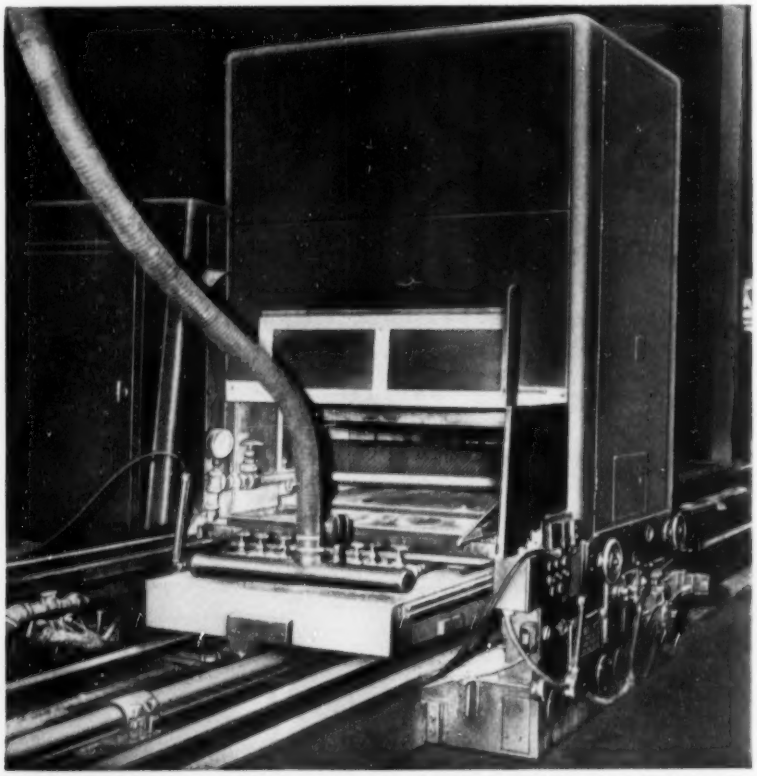


WET-ABRASIVE CUTTING—*Campbell Machine Div, American Chain & Cable Co, Inc, Bridgeport 2, Conn.* Revolving work-bar model with oscillating abrasive cutting wheel, hydraulic wheel feed, and hydraulic work clamps. Model 508 will cut round solid bars up to 8 in. dia. and tubing up to 8 in. OD.

ABRASIVE-BELT MACHINE — *Ryman Engineering Co, Ellwood City, Pa.* Contour grinds airfoil sections of turbine buckets and compressor blades with up to 1/32-in. stock removed on abrasive-belt grinder. Grinder employs a 12-ft belt, driven through a 9-speed transmission by a 15-hp motor. Speeds range from 800 to 7500 sfm. Edge grinder, in which leading and trailing edges are finished, employs a 14-foot belt.

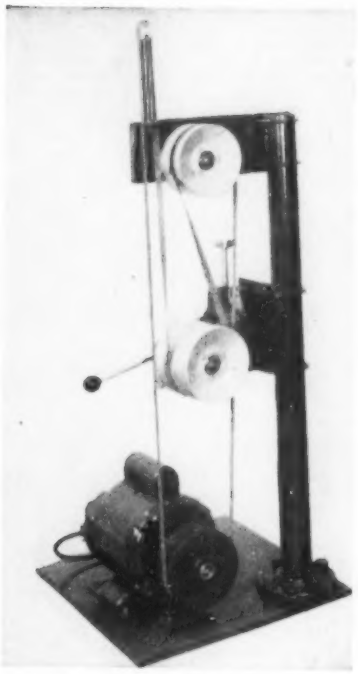


BELT GRINDER—*Porter-Cable Machine Co, Dept PR8, Syracuse 8, N Y.* Equipped with a standard 6-in. belt which runs over 12½-in. platen, the grinder is an economical size for medium work. Designated Model 506, it is used for freehand applications on work which requires flat surfaces, deburring, squaring, chamfering, rounding, and polishing.



BELT GRINDER—*The Carborundum Co, Niagara Falls, N Y.* Tapering aircraft skins through the use of abrasive belts involves use of a wide abrasive belt in conjunction with a "61" rubber-faced contact roll. Varying tapers can be generated. Cuts up to 0.1 in. in depth can be taken over the entire width (up to 72 in.) of aluminum sheets.

BELT GRINDER—*Vonnegut Moulder Corp, 1811 Madison Ave, Indianapolis 25, Ind.* Marschke pneumatically tensioned belt grinder and polishing machine was designed with small contact wheel and high-speed spindle for off-hand clean-up operation on contoured surfaces of small work pieces. The contact wheel is quickly interchangeable without need of manual adjustments.

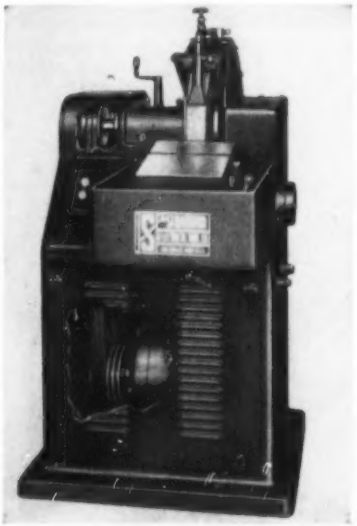


ABRASIVE-BELT GRINDER—*Behr-Manning Corp, Div of Norton Co, Troy, N Y.* Unit is especially designed for inside-dia sanding, grinding, and polishing work and is adaptable to either free-running or platen-back coated-abrasive-belt operations. It can be used on such items as bomb straps, horn rings, gas-tank necks, tin snips and heavy shear rings.

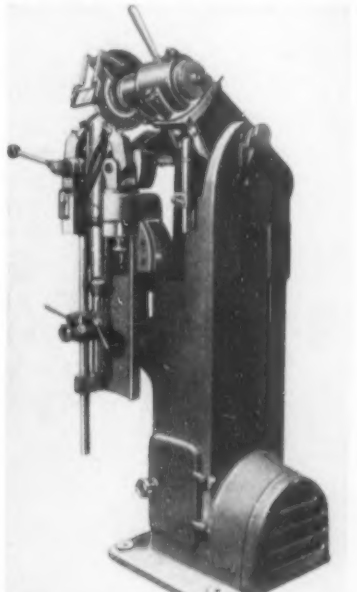
UNIVERSAL GRINDER—*S & S Machinery Co, 140—53rd St, Brooklyn 32, N Y.* This French-made grinder, in addition to the usual straight and taper operations, both internal and external, can generate or finish-grind curvilinear polygonal profiles with tolerances averaging 0.0002 in. These profiles, internal and external, may be: eccentrics, ellipses, triangles (3-lobed), or squares (4-lobed).

TOOL GRINDER—*Nife Inc, Copague, L I, N Y.* This universal tool grinder from Sweden has been redesigned and now uses a No. 50 MMST head instead of the Morse No. 5. The built-in exhauster motor has been changed to a brushless 3-phase type.

BELT-GRINDING ATTACHMENT—*The Carborundum Co, Niagara Falls, N Y. Buckeye Tool Corp, Dayton, Ohio.* This attachment permits the use of abrasive belts on straight-spindle electric and air portable tools. Two models deliver constant spindle speeds of 15,000 rpm and 9000 rpm. Initial belt sizes for these two models are 12x1 and 20x2 in.

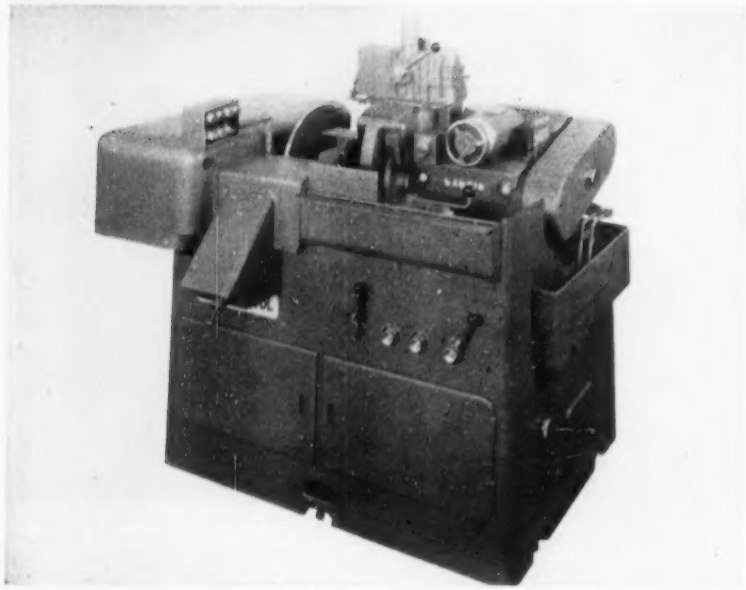


WET TOOL GRINDER — *Standard Electrical Tool Co, 2480 W 6th St. Cincinnati 4, Ohio.* The straight-wheel tool grinder has been redesigned and is now available in 14-, 16-, 18-, and 20-in. sizes. The large area of well-proportioned face with heavy spindle assembly and tilting table serves to deliver precision-ground tools. Illustrated is Model 20S 3-hp grinder with 20-in. diax2½-in. face and a 9-in.-hole grinding wheel.



DRILL GRINDER—*Kurt Orban Co, 205 E 42nd St, New York 17, N Y.* Two front angles of a twist-drill point are ground symmetrically and the thickness of the flutes reduced at the same time by the oscillating grinding wheel used on the May Model A4. Drills from 0.303 to 2.95 in. in dia can be clamped between the spring-loaded jaws.

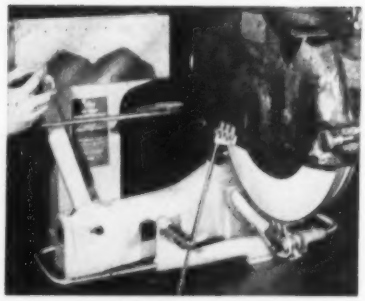
TOOL GRINDER—*H E B Machine Tools, Inc, 341 Madison Ave, New York 17, NY.* This machine (France) is designed and built for carbide tools, has two diamond wheels; one for roughing, and the other for finishing. Tools are held in a ball-and-socket vise. The vise and inclinable table allow grinding single-point tools to constant clearance angles, regardless of radii or dips in profile.



BLADE GRINDER—*Landis Tool Co, Waynesboro, Pa.* This machine is able to grind all types of blades, buckets, vanes, and nozzles now being used in current jet engines. It will grind, with a large 24-in.-dia wheel, the leading and trailing edges in addition to the external airfoil surface, platform, and platform radius. Twisted, warped, or brokenback contours, straight contours, and blades with parallel or nonparallel sides can be ground.

DRILL GRINDER—*McDonough Mfg Co, Eau Claire, Wis.* Sterling Model-D drill and carbide grinder includes increased capacity to cover sizes from ⅛ to 2½ in. Drill is located by the lip being ground. Built-in diamond wheel dresser and automatic compensation for wheel wear.

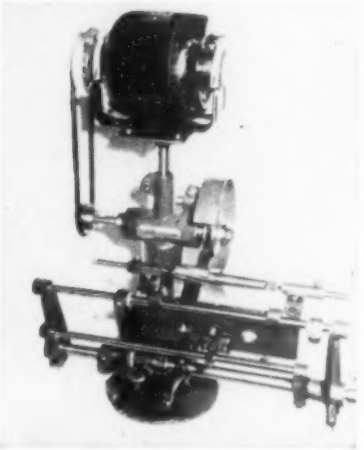
DIVIDING HEAD — *Marvin Machine Products, 514 Ford Bldg, Detroit 26, Mich.* Surface grinder dividing head supplied with 3 index plates, each having six sets of holes, and a bed plate 1x3x16 in., is being marketed.



WHEEL-FORMING ATTACHMENT —*Pratt & Whitney, Div Niles-Bement-Pond Co, W Hartford 1, Conn.* Has been developed for grinding wheels up to 20-in. dia. It is for use on medium and heavy-duty horizontal surface grinders and can true a given form up to 3 in. wide and 1 in. deep in one setting. A vertical pantograph is operated by tracing from a 5:1 ratio templet to guide a diamond across the wheel periphery.

BENCH GRINDER—*Stanley Electric Tools, New Britain, Conn.* Style 246 bench grinder is claimed to overcome difficulties in handling large, oddly shaped parts and castings on small grinders. Motor operates at 2850 rpm full load, 3450 rpm no load, ac only, 50-60 cycles, single phase; 110-115 volts, 125 volts, 150 volts, 220-230 volts.

GRINDER—*Spike Manufacturing Co, 24609 Middlebelt Rd, Farmington, Mich.* Multiple-head surface grinder produces a finish of 1 to 2.5 in. rms on solid carbide blanks. It uses a 150-grit diamond wheel and is reported to hold dimensions to plus-or-minus 0.0002 in.

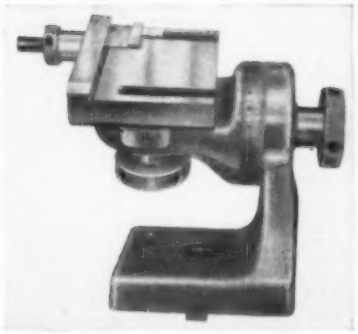


GRINDER — *William Busse Machine Works, 166 Nichols Ave, Brooklyn 8, N Y.* Is quickly adjustable to handle milling and forming cutters spiral end mills, taper reamers, and various circular cutters up to 5½ in. in diameter. Machine weighs 100 lb. and occupies a space 14 x 20 in. and may be bench- or floor-column mounted.

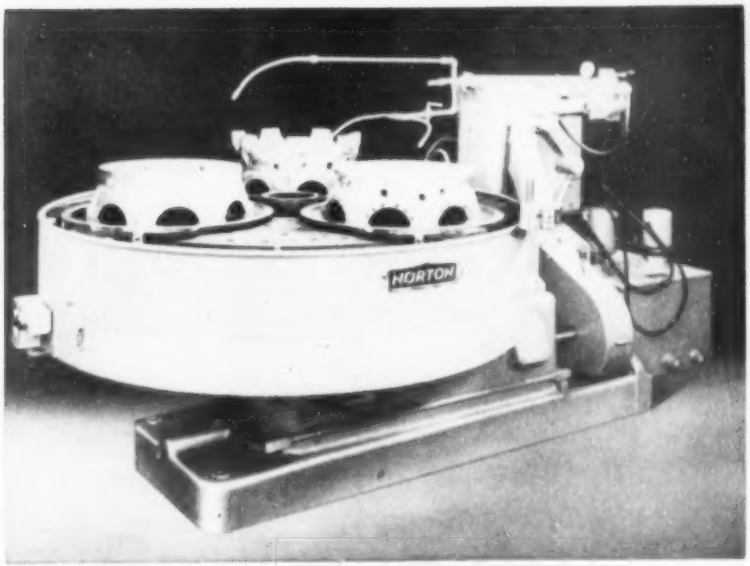
INTERNAL AND FACE GRINDER—*Kurt Orban Co, 205 E 42nd St, New York 17, N Y.* Internal and face grinding operations are performed in a single setting of the work on the Reinecker Model JSOP Machine. Working range: bores from 0.16 to 3 in. dia, 5-in. maximum grinding depth, and 9-in. maximum face grinding dia.

DRUM SANDER—*American Diamond Saw Sales, 120 NW Ninth Ave, Portland 9, Oregon.* Cone-Loc drum sander operates at speeds around 3500 rpm and provides over 7000 sfpm cutting speed with coated abrasives. It weighs 3½ lb. A split drum is used that permits the use of the strips of abrasives. It is able to operate smoothly at speeds up to 5000 rpm.

CUTTER-GRINDER FIXTURE — *Industrial Grinding Co, 1600 W Magnolia Blvd, Burbank, Calif.* Developed to handle a wide variety of work—countersinks of all types, center drills, intergral pilot cutters, and right- or left-hand pilot drills. With only two wrenches, the fixture is easily adjusted for the correct relief and angle in relation to the wheel.



CHASER-GRINDING FIXTURE — *Landis Machine Co, Waynesboro, Pa.* No. 20 chaser grinding fixture is used to grind the compound rake and lead angles of Landis tangential chasers. Can be adapted for any grinding machine which has a traversing table regardless of the wheel used. The fixture covers chaser widths from 1¼ to 4⅜ in., from ⅞ to 1¼ in. by addition of a grinding block.



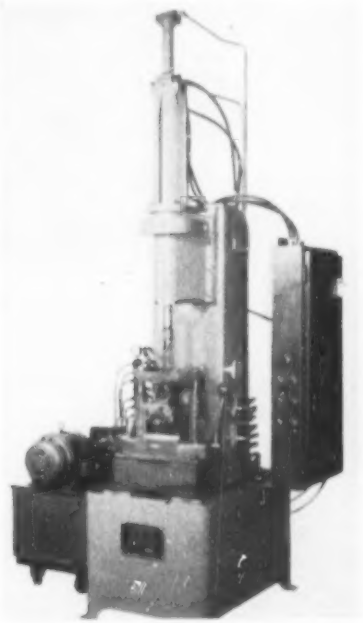
LAPPING MACHINE — *Norton Co, Worcester 6, Mass.* Equipped with a 60-in. dia segmental bonded abrasive lap for lapping large parts. Soft parts can be lapped to provide seal or wear surfaces, or surfaces to be subsequently drilled or milled, without an immediate cleansing to remove traces of embedded abrasive.

GRINDER—*PDQ Grinder Co, 6 Manhasset Ave, Port Washington, N Y.* 12-in.-dia-cylinder grinding wheel mounted in a vertical plane and recessed within the actual work surface of the grinding table. This permits finishing of surfaces as wide as 9½ in., with no limitation as to length and height. Main drive is from a 2-hp vertical-mounted motor.

CARBIDE TOOL GRINDER—*Thomas Prosser & Son, 120 Wall St, New York 5, NY.* Model AA carbide tool grinder has ½-hp. motor and a heavier shaft than the previous model for freedom from vibration. Quick-acting index tables permit accurate angle setting. Furnished in several models and sizes, for wet and dry grinding.

SPECTRUM LAPPING METHOD — *Penn Scientific Products Co, 5941 Alma St, Philadelphia 24, Pa.* Spectrum diamond lapping compound in any desired grit size is applied to special Spectrum-lapping wheels in this new method. The Spectrum wheels are made from materials that retain their shape and wear indefinitely, and are interchangeable on all tool grinders.

LAPPING COMPOUND — *Robert Marks Co, 47 Goddard St, Providence, R I.* Boron carbide used as a lapping agent is claimed to cut several times faster and resist breakdown better than any material used in lapping other than diamond. It will cut approximately 2/3 as fast as diamond and can be used on all materials, both metallic and non-metallic.



VERTICAL HONING MACHINE — *Staple Engineering Co Inc, 1315 S Woodward Ave, Birmingham, Mich.* The Model D-12 has a range of 1¼ to 4 in. dia and a 10-in. stroke that is electrically controlled and hydraulically operated. Spindle drive is by spiral gears and V-belts, with pick-off sheaves for speed change. A 3-hp motor (1200 or 1800 rpm) is standard for the spindle drive.

1953 American Machinist Production Preview

GEAR CUTTING AND FINISHING

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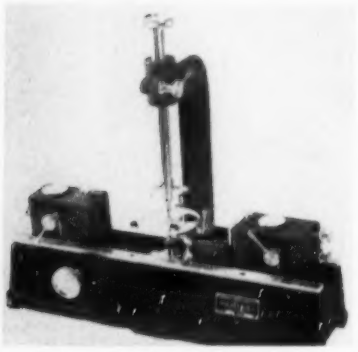
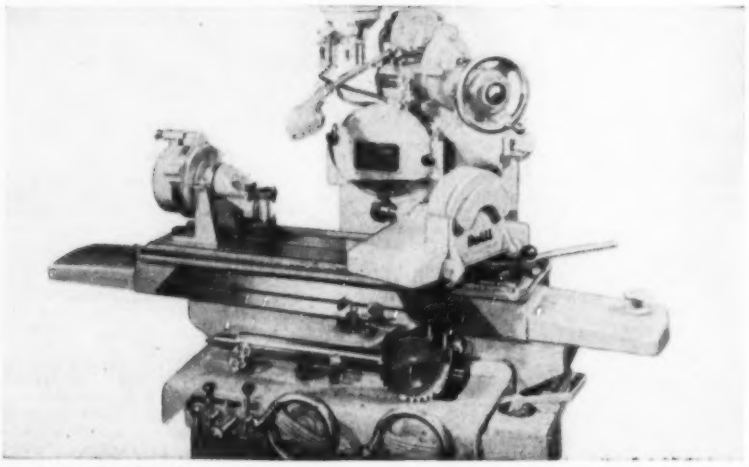
GEAR SHAPERS—*Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Twelve new design features on the Series-1800 line of Shear-Speed gear shapers provide better performance, reduced tool-change time, and easier maintenance.

GEAR CHAMFER—*Modern Industrial Engineering Co, 14230 Birwood, Detroit 4, Mich.* The Model BM-2055 Burr-Master can chamfer and deburr tooth edges at both heel and toe of an 8-in.-dia. 99-tooth, 12.53-pitch zerol bevel reduction gear in 30-sec cutting time.

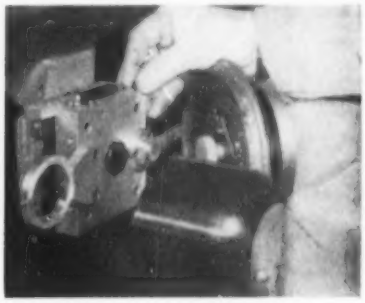


GEAR CHECKER—*Orlandi Gear and Machine Co, 16195 Meyers Rd, Detroit 27, Mich.* A helix adapter for gear checkers simplifies setup for checking helix angle—practically eliminating mathematical computations. A new rolling attachment for use with a master gear makes possible the rapid check of pitch diameter and concentricity to 0.001 in.

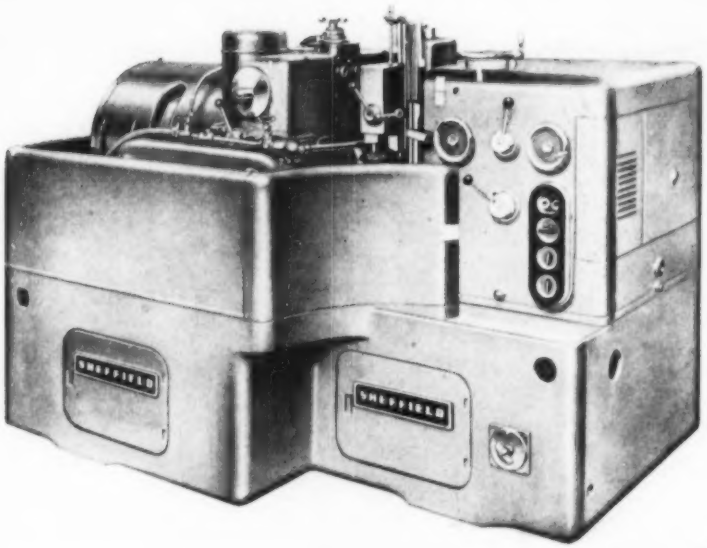


GEAR GENERATOR—*The DoAll Co, 254 N Laurel Ave, Des Plaines, Ill.* DoAll's universal involute-gear generator attachment is able to cut a gear without first producing master gears, cylinders, forms, racks, hobs, etc. Only standard grinding wheels are required and setups are simple.

GEAR HOBBER—*Hamilton Tool Co, Hamilton, Ohio.* No. 1 gear hobber permits 180° rotation of the hob-spindle turntable, and reverse rotation of the spindle itself, without change of work-spindle rotation, or direction of feed. Also, the machine can now use both straight-hole hobs and tapered-hole hobs with taper either right to left or left to right.

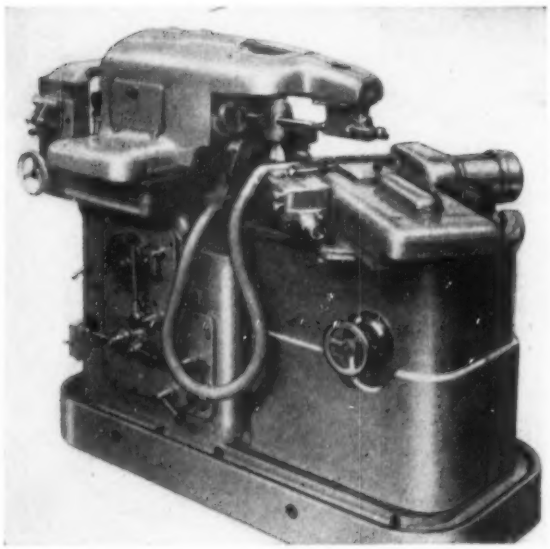


CHAMFERING MACHINES—*Modern Industrial Engineering Co, 14250 Birwood, Detroit 4, Mich.* These burring and chamfering machines for hypoid pinions have output rate up to 300 pinions per hr per station per machine. Available in 1-, 2- and 3-station models. Simultaneous chamfering and removal of burrs. Takes up to three pinions of different dimensions.

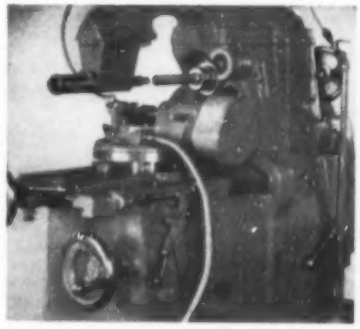


GEAR GRINDER — *Sheffield Corp, Dayton 1, Ohio.* Periphery of the wheel is formed with a helical rib by a combination of Crushtrue and diamond dressing. The gear blank, mounted on a mandrel between vertical dead centers, rotates continuously at a set rate in direct relationship to the grinding wheel. Gears can be up to 8 in. dia with maximum length of tooth 4 in. Pitch range is from 8 to 50 diametral; maximum helix is 45.

STOCK DIVIDER—*National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* The stock divided allows the machine operator to clamp each gear on its arbor while its predecessor is being ground. Thus the only down time is that required to unload the finished gear and immediately load the next. It consists of movable head and tailstocks and a checking head adjustable to work-gear dia.



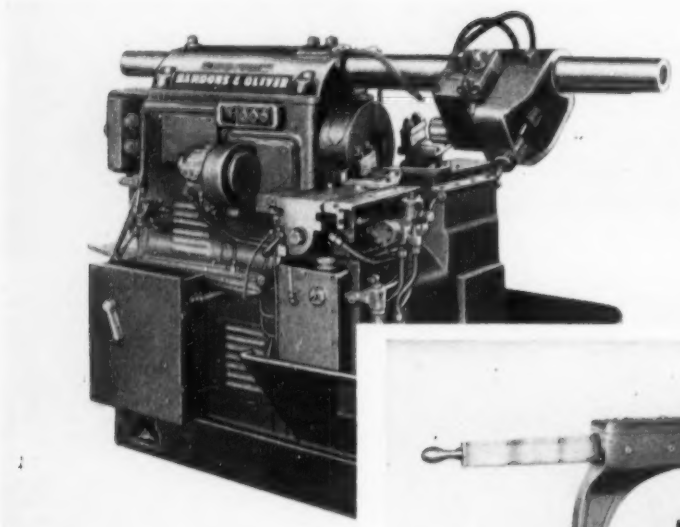
GEAR GRINDER — *Cosa Corp, 405 Lexington Ave, New York 17, NY.* With this machine, spur and spiral gears are ground with a grinding gear bevelled on both sides. The gear blank is supported on a shaft between centers on the overarm of the machine. The Kolb gear grinder will grind gears from 1½" p to 12" with a module form 1 to 6.



GEAR HOBBER—*Hamilton Tool Co, Hamilton, Ohio.* Now included as standard equipment on Hamilton No. 1 gear hobbers (small, precision spiral, bevel and face gears, worm and worm gears, gear segments, and pinions) is a draw-bar collet operated by a hand wheel.

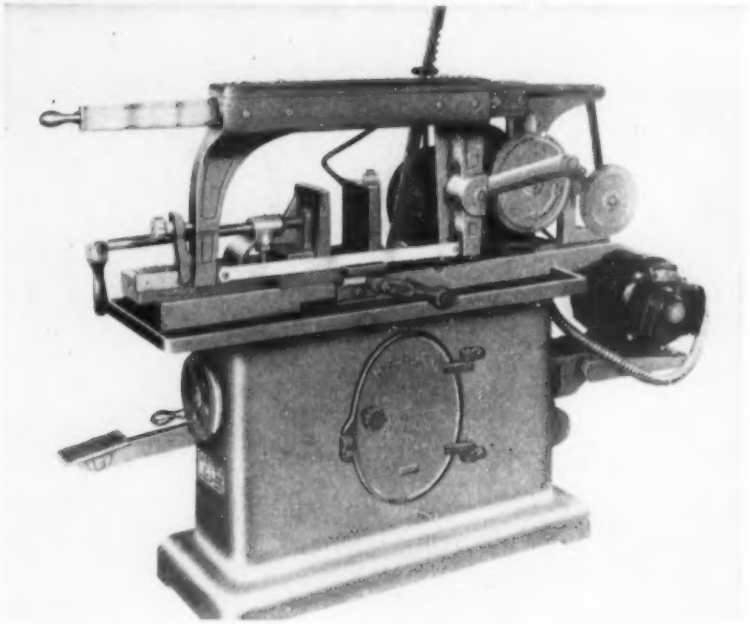
1953 American Machinist Production Preview

CUTOFF AND FILING

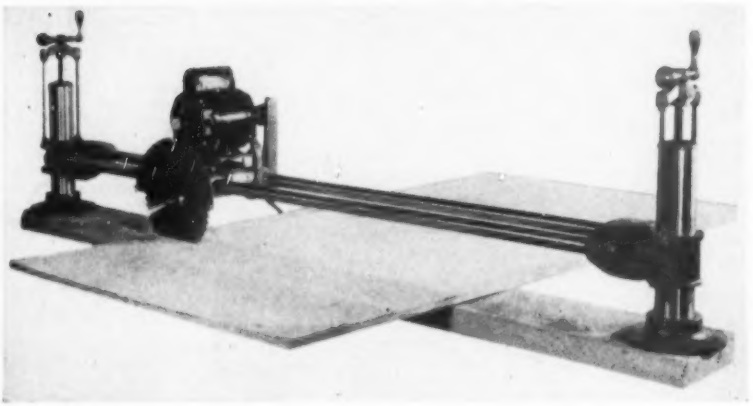


CUTOFF LATHE—*Bardons & Oliver, Inc, 1134 W 9th St, Cleveland 13, Ohio.* Electric remote control on these lathes permits automatic cutoff to any length. Spindle speeds range from 85 to 1100 rpm with four changes. The No. 33 model has a capacity of up to 3 in. dia or 2½-in. pipe. The No. 34 has 4 in. dia or 3½-in. pipe capacity.

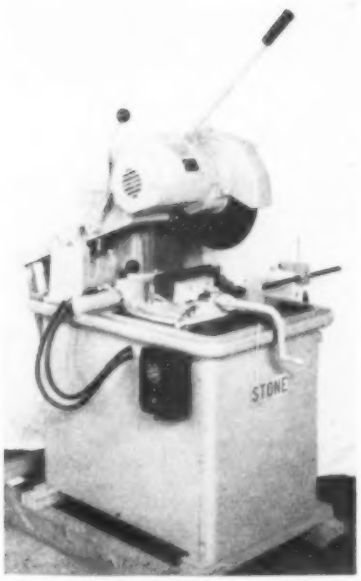
POWER HACKSAW — *Sales Service Machine Tool Co. 2363 University Ave, St Paul, Minn.* The No. 5 power hacksaw has capacity for a 9¼-in. round, or an 8x9-in. flat. A blade-pressure regulator is controlled by a wheel at the front of saw, providing pressures from 0 to 200 lb.



CUTTING MACHINE — *DeWalt Inc, Lancaster, Pa.* ME-1 High-speed metal-cutting machine offers complete operator protection. Saw blade or abrasive wheel cuts bar stock up to 3 in., light-wall steel tubing up to 4 in. The motor is 10 hp and spindle speed 3425 rpm.

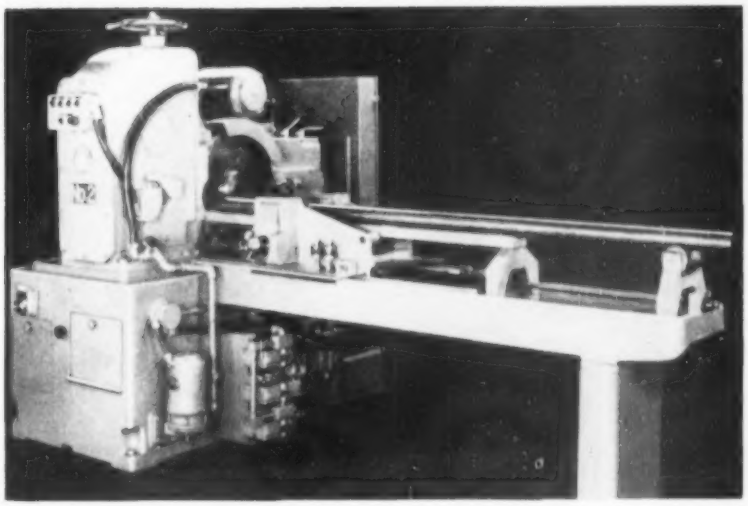


LONG-RAILED SAW—*Hendrick Mfg Corp, 11 Selman St, Marblehead, Mass.* Long railed, radial-arm saw, model MLR-1, has been designed for cutting of large sheet rock. Available with rails up to 10 ft in length, it can handle 4-ft by 8-ft sheets easily; rails can be tilted from 0 to 90° for mitering or rabbeting.



CUTOFF MACHINE—*Stone Machinery Co, 633 Fayette St, Manlius, N Y.* M75 cutoff machine, for both ferrous and non-ferrous metals, has increased power in the cutting head—from 5 to 7½ hp.

BAND SAW—*Tannewitz Works, Grand Rapids, Mich.* Cuts magnesium and aluminum castings. Clearance of 55 in. under the guide; is of welded-steel construction and employs 42-in wheels. All controls including handwheels for raising and lowering the upper wheel, vertical movement of the guide post, counterweight for varying sawblade tension, and alignment of upper wheel, are within easy reach of the operator.

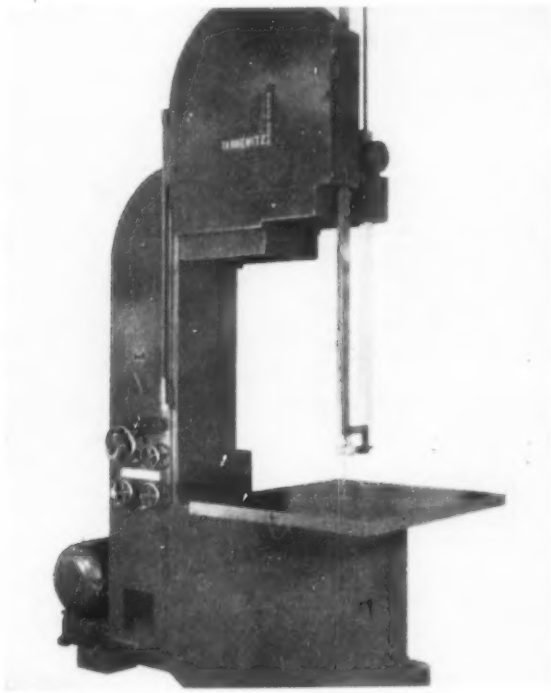


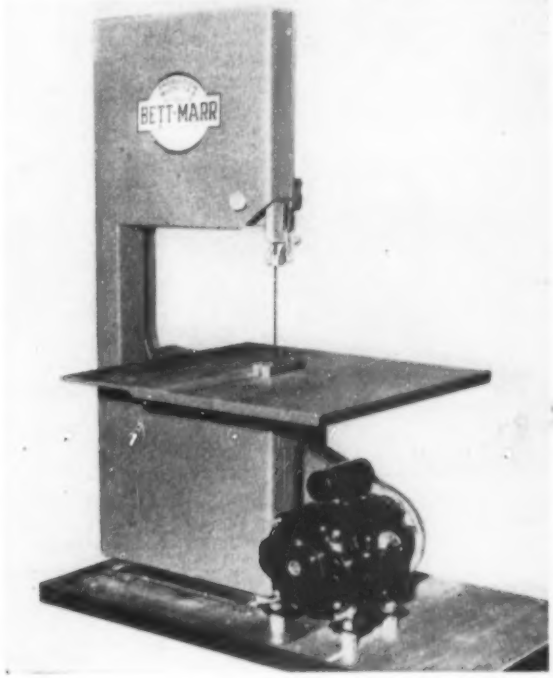
AUTOMATIC CUT-OFF SAW—*Consolidated Machinery and Supply Co, Los Angeles, Calif.* The machine uses a high-speed, carbide-tipped, circular saw blade to cut off aluminum shapes up to 3x5 in., or aluminum solids up to 2x4 in. Some cuts of 2x4 aluminum bar stock of 24 ST hardness take less than 8 sec. Maximum capacity of the vise and 12-in. saw blade is 3½x6 in.

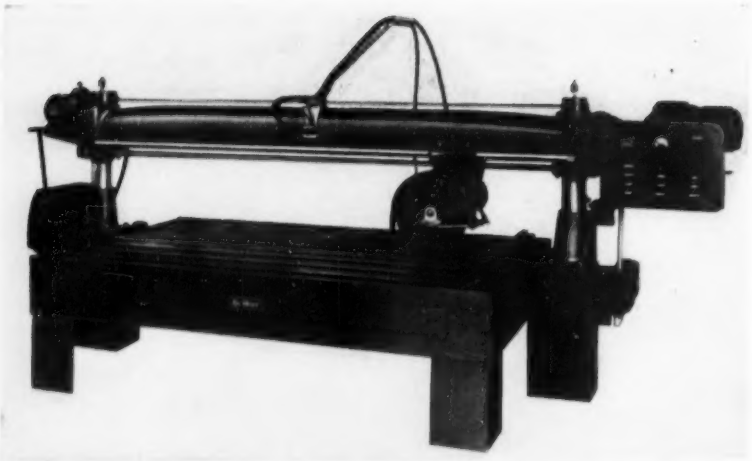
CUT-OFF MACHINE — *Continental Machine Co, 1952 N Maud Ave, Chicago 14, Ill.* Machine will cut up to as many as 60 pieces of 12-in. pipe and tube per hour. It is rated to cut more pipe per hour than manually-operated machines in addition to reducing operator fatigue.

CIRCULAR SAWING MACHINE — *The Motch & Merryweather Machinery Co, 715 Penton Bldg, Cleveland 13, Ohio.* Can be equipped to automatically feed bar stock for shell forgings. The automatic feed consists of two heavy-duty, hardened, serrated feeder grippers mounted on a slide. The bar stock is positioned on the supporting V-channel under the hydraulically-actuated vertical vise for the initial cropping, squaring cut. Thereafter the feed is automatic.

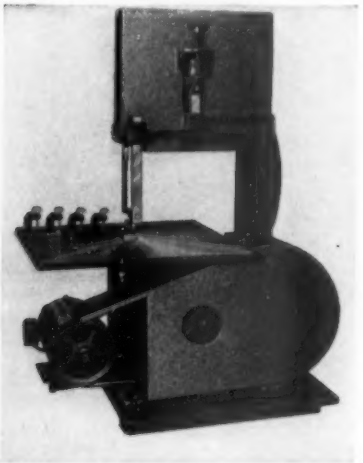
SHEET METAL SAW—*Bett-Marr Mfg Co, Hopkins, Minn.* For production work in metal, plastic sheet metal and woodworking shops. Speed range of from 125 to 220 fpm gives quick selection of correct blade speed for material to be cut. Cuts stack (50 or more) galvanized sheet metal at speeds up to 15 ipm. Over-all depth and height is 34 in.



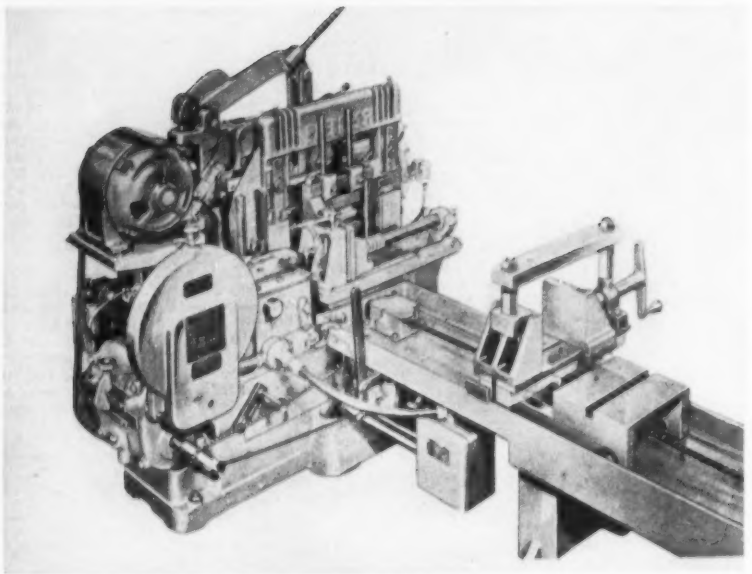




CUTTING MACHINE — *DeWalt Inc, Lancaster, Pa.* Dual-column cutting machine is designed for cutting sheets, slabs, and plates of steel, non-ferrous metals, plastics, and other composition materials. All four motors are controlled from a single panel board. Cutting feeds through the material range from 2 to 45 ipm.



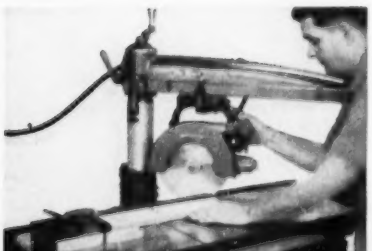
BANDSAW—*Bett-Marr Mfg Co, Hopkins, Minn.* All-purpose 14-in. ball-bearing bandsaw has blade speeds from 125 fpm to 2200 fpm. Unit cuts 50 to 70 stacked galvanized metal sheets at speeds up to 15 in. per minute. The 20x-22-in. table handles large work.



BANDSAW — *Tannewitz Works, Grand Rapids, Mich.* In conjunction with a 50,000-ton press, trims the edges of complete airplane wing stampings. It is equipped with two regular 36-in. wheels above and below the sawing area and a third wheel of 30-in. dia in the column on the left of the table.

WORKTABLE—*Stone Machinery Co, Manlius, N Y.* Table for Stone Model-SS20 cutting machine provides a complete setup assembly. The hand-crank feed and air-activated vise speed up the cutting.

WIRE CUTTER—*Carlson Tool & Machine Co, Geneva, Ill.* Heavy-duty machine for cutting black-tempered and other straight wires is 62 in. long, 30 in. wide, and 57 in. high. Cutting capacity varies up to 150 lb per hr.



METAL CUTTER—*DeWalt Inc, Lancaster, Pa.* Model GW is a 1-hp radial arm machine for fabrication of light metals. In addition to straight cutoff, it produces miter, bevel, and compound-miter cuts; can be used with saw blades on aluminum and other non-ferrous stock, or with abrasive on small-size steel and other ferrous metals.

HACKSAWING MACHINE — *Peerless Machine Co, 1602 Junction Ave, Racine, Wis.* Permanently adjusted magnetic clutch is employed in the automatic bar-feed conveyor available for use with Mechani-Cut hacksawing machines. With this equipment, the cycle becomes 100% automatic following loading of the conveyor to completion of the last cut on the stack. Unit is available for Mechani-Cut machines in 7x7- and 11x11-in. capacities.

BAND SAW—*Tomlee Tool and Engineering Co, 718 Washington Ave, North Minneapolis 1, Minn.* This saw, within the limits of its 5⅜-in. throat capacity is intended as an auxiliary unit to the large machine. Worktable tilts to 45° and is grooved to take a mitre gage for angle or compound cuts. Known as the Tomlee, it is powered by a ½-hp motor.

BOLT CUTTER—*Manco Mfg Co, Bradley, Ill.* Reversible cutting blades claimed to double blade life automatically with little increase in cost. Known as the Model 30 MCC, it has forged steel handles.

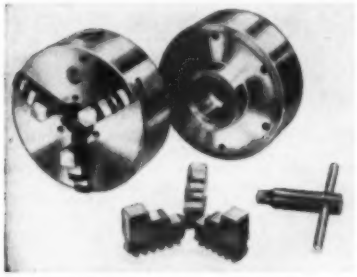
AIR-OPERATED SAW — *Heston & Anderson, Div of St Paul Foundry & Mfg Co, Fairfield, Iowa.* Air-operated swing saw performs cutoff operations in metals, woods or plastics. The three models will take either a 10-, 14- or 16-in. blade or abrasive wheels maximum dia. The cutting capacity varies from 3¾x6 in. for the smaller model, to 1x30 in. in the large model.

CUTOFF MACHINE — *Cosa Corp, Lexington Ave, New York 17, N Y.* This machine, made by the Blasi Co of Switzerland, has a rigid, square base to house the abrasive cut-off wheel and the two-speed (1500-2000 rpm) 6-hp drive motor. Capacities are up to 1½-in. steel, 2½-in. brass.

BANDSAW — *Transmares Corp, 15 William St, New York 5, N Y.* Uses a 1½-hp. 220/440-v motor which permits instantly variable speeds from 33 ft to almost 2400 ft per min. It is a 16-in. heavy-duty steel and metal bandsaw. Pushbutton control with remote thermal and electromagnetic release.

1953 American Machinist Production Preview

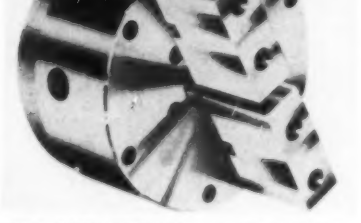
TOOLS AND ACCESSORIES



THREE-JAW UNIVERSAL CHUCK—*Westcott Chuck Co, Oneida, N Y.* No. 6907 6-in., 3-jaw universal chuck with threaded body back for direct mounting on lathes, milling machines, grinders, and other machine tools with 2¼ in.-8 spindles. Since no adapter is required, the chuck is mounted close to the spindle bearing, thus minimizing chatter.

MAGNETIC CHUCKS — *Hanchett Magna-Lock Corp, Dept 100, Big Rapids, Mich.* Three small magnetic chucks are now available for small machine tools and bench work. Sizes are 5x10, 6x12, and 6x18 in., construction is all-steel, and they operate on ac voltage.

MAGNETIC CHUCKS—*Viking Industries, 220 Montague St, Rockford, Ill.* Two small-sized magnetic chucks concentrate deep magnetic holding power in a small, compact area. Model G4 has a surface plate 3⅝ in., overall height of 15/16 in. Counterbored ¼ in. mounting holes are spaced on 4¼-in. centers. Model G4A, has one-third greater holding power.



TWO-JAW CHUCK — *Buck Tool Co, 2015 Schippers Lane, Kalamazoo, Mich.* The Buck Adjust-Tru rechucks with the same speed as a scroll chuck without need for further adjustment. The chucks are made in 6- and 7½-in. diameters.

CHUCK-JAW ADJUSTER — *The Whiton Machine Co, New London, Conn.* American serrated jaws can be precisely adjusted through use of the Whiton Micro Jaw-Set. It can be employed with any make of manual or air chuck. It is available for all American Standard chucks having serrated jaw sizes ranging from 15 to 36 in. dia.

INDEPENDENT CHUCK—*Buck Tool Co, 2015 Schippers Lane, Kalamazoo 62, Mich.* This 4-jaw Independent chuck is built around the spindle and not beyond it, eliminating excessive overhang. Especially for lathes from 9 to 16 in. Gripping is accomplished by an operating screw ⅛ in. larger in dia than usual. Screw has a 9-pitch Acme thread which makes for finer adjusting and quicker, easier centering of the work.

GRINDER CHUCK—*Royal Oak Tool & Machine Co, (D-S Grinder Div), 619 E Fourth Ave, Royal Oak, Mich.* 6-jaw chuck for the D-S radial relief-grinding fixture facilitates grinding tools not readily held in a collet, or for which no adequate-size collet is available.

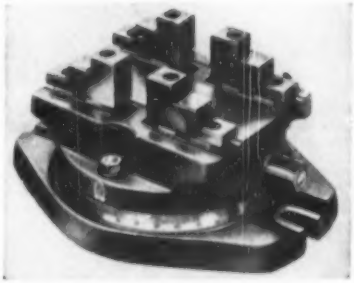
VISE ADAPTER—*The Marvel Tool and Machine Co, St Clair, Mich.* Holds unusual shapes in drillpresses, shapers, milling machines, and home workshops. The ball head's flat holding surface adjusts to the proper angle for holding unusual-shaped pieces of work from slipping.

VISE—*Black Drill Co, 1400 E 222nd St, Cleveland, Ohio.* Device for locating centers on runs of pieces of various dias consists of two opposed pneumatic cylinders mounted on a cast iron base, with two master jaws at the ends of rods attached to the pistons. Jaws travel along guides, and movement is mechanically synchronized.

VISE JAWS — *Magne-Grip Tool Co, 4900 W Madison St, Chicago 44, Ill.* Soft jaws for vises utilize built-in permanent magnets, can be quickly snapped into position. Two-way V-groove locks the work in, holding it in any position desired, regardless of size or shape.

PNEUMATIC VISE—*Production Devices, Inc, Whitehall, N Y.* The Model S-7 has a grip of 100 times the air line pressure. A wider vise-body contour with thickened side walls result in a more rugged and rigid vise. The chip plate rides in a slot in the vise bed and moves with the movable jaw.

VISE—*Connors and Davis Sales Corp, Circuit Ave, West Springfield, Mass.* American Positive-Grip vise is able to grip contours of odd-shaped pieces, reducing the jigs or fixtures usually necessary. The vise has even pressure distribution with each jaw working independently.

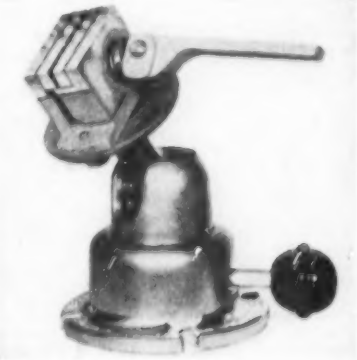


MACHINE VISES—*Precision Products Co, 76 Rogers St, Branford, Conn.* Horizontal swivel and universal vises eliminate the need for many jigs and fixtures, reduce setup time, and allow free access to the work. A wide variety of settings is available through combinations of interchangeable steps and solid jaws.

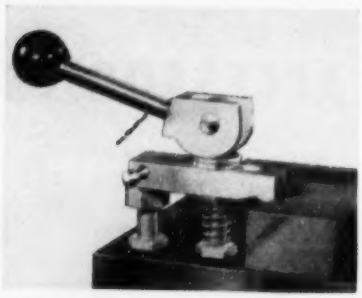
GAGE VISE — *Erickson Tools Div, Erickson Steel Co, Hamilton Ave, Cleveland 4, Ohio.* Five surfaces of this vise are accurate to 0.0003 in., it is claimed, which saves setup time for machine jobs. Jaw opening is 2⅝ in., total size is 2⅝ in. square by 6 in. long. Weight is 7½ lb.

VISE—*Bellows Mfg Co, Dallas, Texas.* This vise can be used with a surface grinding attachment for tapping on a drillpress, or for assembly work. Attached to the bench, dimensions are: from base plate to top of jaws, 9½ in; opening of jaws, 3 in.; jaw width, 3 in.

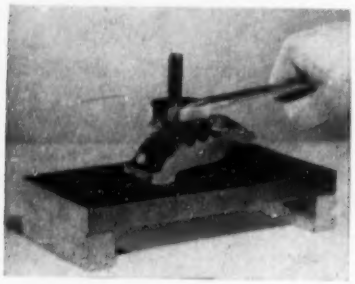
BENCH VISES—*Van Products Co, 3734 W 12th St, Erie, Pa.* Two high-powered, air-operated bench vises, Models 610-DP and 1000-DP, have power ratio of 100:1. Both models have jaws 6 in. wide and max openings of 10 and 11 in. respectively.



CAM VISE—*Wilton Tool Mfg Co, 925 Wrightwood Ave, Chicago 14, Ill.* The vise is mounted on the Junior Powr-arm, the tool which permits an assembly operator to position work without holding it. Cam travel is ¾ in. with an adjustable opening.



FIXTURE CLAMP—*West Point Mfg Co, 26935 W Seven Mile Road, Detroit 19, Mich.* This quick-action clamp is rustproofed and has spherical washers to compensate for any irregularities in the work. The clamp is available in five sizes.



SELF-SETTING CLAMPS — *Alpha Tool & Supply Co, Box 119, Westwood, N J.* These clamps use three inter-related curved contact surfaces. It allows each clamp a gripping capacity for a wide range to accommodate various thicknesses of bolsters. They are available in sizes ranging from 3 in. long with 1¼-in. height capacity, to 8 in. long with 3¾-in. height capacity.

CLAMP—*Centinela Industrial Supply Co, 11930 Inglewood Ave, Hawthorne, Calif.* By utlization of a torque-converting ball-bearing trunion in this new Saxton Clamp, distorting, twisting action is said to be completely eliminated. Available in sizes of 1½, 3, 6, and 12 in.

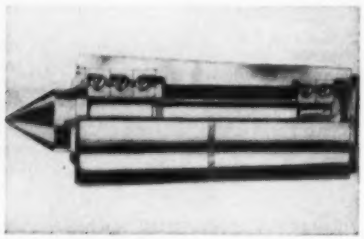
STRAP CLAMP — *Everett Sales Co, Brooklyn 32, N Y.* Self-aligning strap clamps hold work securely on machine table or face plate. A ball-and-socket arrangement make the gripping members free-floating and universal.

TOGGLE CLAMPS—*E & E Engineering, 14404 Mack Ave, Detroit 15, Mich.* La-Ko and Thayer lines of toggle clamps have Merriman replacable hardened steel bushings installed at all pivot points; bushings have a separated surface that cuts its own bearing points; Thayer provides a max holding pressure up to 2500 lb; lightweight La-Ko clamp affords a 650-lb holding pressure.

DOG AND DRIVER — *Ready Tool Co, 554 Iranistan Ave, Bridgeport, Conn.* Dog and driver is claimed to provide accurate spacing on taper work and spiral cutting. It is supplied in two sizes, No. 130 for ¼- to 2-in. capacity and 132 for ¾ to 2⅜ in.

FIXTURE LOCK—*National Machine Tool Co, Racine, Wis.* This screwless, quick-acting locking device for adapting to jigs and fixtures eliminates need for clamps and holding tools. Holding pressure is up to 1500 lb.

DEAD CENTER—*The DoAll Co, Des Plaines, Ill.* Dead center is made of Exmet, a new alloy developed for high-speed, high-temperature jet-engine operation. These centers are available in all sizes of Morse, Brown & Sharpe, and Jarno tapers, both in conventional styles for lathes and in a gashed type for grinding operations or turning where extra clearance is needed.



ANTI-FRICTION CENTERS—*Ready Tool Co, Bridgeport, Conn.* Built-in bearings eliminate overhang and permit full clearance as well as max distance between centers. Assembled with precision angular-contact, anti-friction ball bearings pre-loaded and locked in. Bearings are mounted for max radial and thrust-load capacity.

ROLLER-BEARING CENTERS — *Ready Tool Co, 554 Iranistan Ave, Bridgeport, Conn.* Red-E center has increased head size permitting use of larger bearings for greater radial and thrust load capacities. Preloaded ball bearings are in a single row.

LIVE CENTER—*Dakon Tool & Machine Co, Inc, 496 Broadway, Brooklyn 11, N Y.* The Quadro precision live center has two double-row precision preloaded ball bearings absorbing combined radial and end thrust.

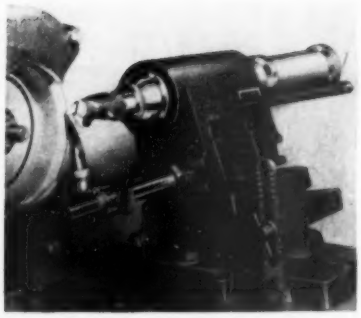
CARBIDE-TIPPED CENTERS — *Ready Tool Co, 554 Iranistan Ave, Bridgeport, Conn.* Speculative point to which carbide tipped centers can be ground has been eliminated by addition of a grinding safety life line. The life line indicates the maximum amount that the center can be ground.

HOLD-DOWN FIXTURE — *Ready Tool Co, 554 Iranistan Ave, Bridgeport 5, Conn.* Jaw recess surfaces of hold-downs are so designed that when vise pressure is exerted the jaws are forced down, gripping the work securely. The jaws are made in three sizes: 4, 8, and 12 in.

SET-UP ACCESSORIES—*J H Williams & Co, 400 Vulcan St, Buffalo 7, N Y.* T-bolts, nuts and flat washers, T-slot nuts and set-up wedges can be used on planers, shapers, milling machines, and other similar applications. The T-slot bolts are available in ⅜-, ½-, ⅝-, ¾-, ⅞-, and 1-in. T-slot sizes and a wide range of lengths.

FIXTURE CLAMP — *Centinela Industrial Supply Co, 11930 Inglewood Ave, Hawthorne, Calif.* Incorporating the Saxton principle of clamping, these quick-acting fixture clamps have screw operation and vibration absorbing, spring bearing trunnion to provide a steady grip for riveting and other abusive applications.

CLAMPING — *E & E Engineering, 14404 Mack Ave, Detroit 15, Mich.* Merriman pressure unit, designed to facilitate fast clamping action takes the place of a screw. Unit is screwed to fixture or clamping area by means of a welded 1-in. nut or a tapped standard hole. Device affords up to 9 in. of clearance or travel.



SHARPENING FIXTURE — *Weldon Tool Co, Cleveland, Ohio.* As hinged sub-base is raised or lowered, peripheral clearance of the end mill being sharpened is changed accordingly. An arm at the side with graduated notches indicates degree of clearance and guides operation. If the setting on the arm is 10°, for example, the angle produced on the end mill will be 10°.

COLLET HOLDER—*Modernair Corp, San Leandro, Calif.* Air-operated collet-holding fixture of compact size permits multiple installation on production indexing tables or where previously rapid positioning of small parts has been impossible. The fixture uses standard shop collets 1A and 3C styles up to ½-in. capacity.

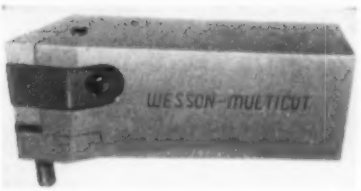
COLLET-CLOSING ATTACHMENT —*Crozier Machine Tool Co, Hawthorne, Calif.* All wearing parts on this attachment are hardened, and the handwheel is self-centering on the spindle. It is available in three models: 1-A, with 0.750-in. minimum bore of spindle, 4-C for 1.062-in. minimum bore, 5-C for 1.375 in.

JIG, FIXTURE ELEMENTS — *Wharton & Wilcocks of America, Inc, 17 Battery Pl, New York 4, N.Y.* The Wharton universal jig and fixture system, British-designed and now available in this country, offers a practical method of unit tooling with unlimited applications. It consists of graduated elements with bases and fastening devices which, when assembled, will make jigs and fixtures for machining or assembling parts for almost any operation.

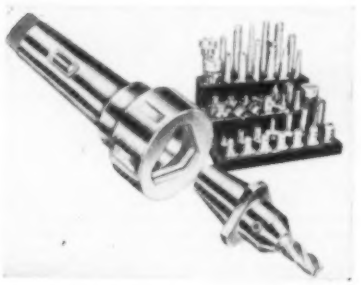
PARALLEL UNIT — *Acro Safety Parallel Div, 24 S Crawford Ave, Chicago 24, Ill.* The Acro die cradle eliminates haphazard methods of supporting dies, jigs, etc. during drilling, counterboring, tapping, milling, or grinding.

STOP-COLLAR, HOLDER — *Metal Cutting Tools, Inc, Rockford, Ill.* With this unit, the depth of cut may be regulated by stopping the adjustable collar or nut against the jig or workpiece being machined. It is available in a range of sizes for use on work requiring specified depth of cut.

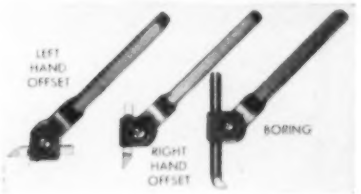
ANTI-FRICTION CENTER — *Ready Tool Co, 554 Iranistan Ave, Bridgeport 5, Conn.* Red-E anti-friction center has been designed for turning and grinding large parts weighing up to 12 tons. A special collet arrangement clamps over the OD of tail stock quill. Unit is well suited for heavier feeds and carbide tools. Outside spindle bearing center has a duplex arrangement of angular preloaded precision bearings for smooth operation without end or side play; chatter and wobble is eliminated.



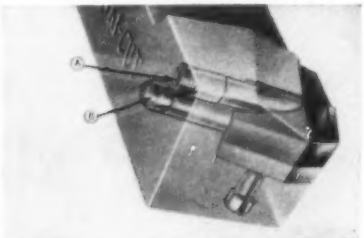
TOOLHOLDER—*Wesson Co, Ferndale, Mich.* Toolholder takes 55° diamond-shaped solid Wessonmetal inserts, which are able to cut in either direction. Clearance is provided on both sides of the insert to permit this multi-cutting action. The insert can be turned end for end and give the user two new cutting edges.



TOOLHOLDER—*The Portage Double Quick Tool Co, 1026 Sweitzer Ave, Akron, Ohio.* P. D. Q. toolholder has locking feature for fast tool changes and constant repositioning. Three-point holding of the taper-shank design eliminates runout. The 57-piece tool set includes holders for boring, milling, and lathe work.



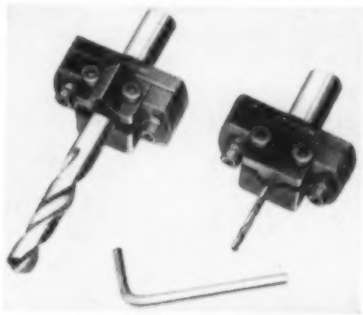
TOOLHOLDER — *The Walton Co, Box 5, Elmwood Branch, Hartford 10, Conn.* Not only is the bit securely gripped top and bottom, but is so held that no lateral motion is possible. The capacities of the four sizes made range from ⅛ in the smallest to 7/16 in. in the largest.



TOOLHOLDER—*Wesson Co, Detroit, Mich.* Huski-Cut holder has been added to the line of 10 standard holders in 100 standard sizes made by Wesson. Fine adjustment is possible because there are no serrations with which to contend.

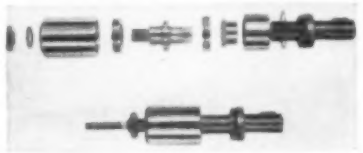
TOOLHOLDER—*Scully-Jones & Co, 1902 S Rockwell St, Chicago 8, Ill.* This sleeve stub-taper toolholder for turret lathes and screw machines takes counterbores, countersinks, core drills, and similar tools with stub tapers. It is available for No. 2, 3, and 4 stub tapers

SPRING TOOLHOLDER — *Ready Tool Co, 554 Ivanistan Ave, Bridgeport, Conn.* Spring toolholder saves time when grinding is necessary because: (1) it eliminates need for fitting to gage, (2) no adjustment in the tool post is necessary after grinding.



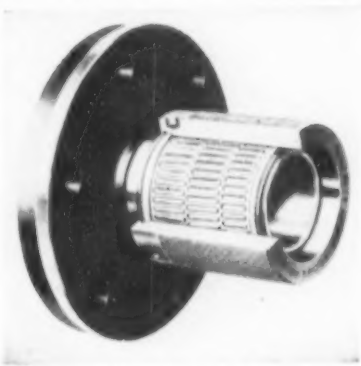
HOLDER—*Brookfield Inc, 755 Boylston St, Boston 16, Mass.* The Brookfield toolholder holds drills, counterbores, reamers, and other tools of any dia from 1/64 to ½ in. without bushings or other accessories. Stock shank sizes are ⅝ and ¾ in.

EXTENSION DRILL CHUCK—*Ritmar Co, 183 New York Ave, Huntington, N Y.* Little Beaver extension chuck eliminates soldering, brazing, and purchasing of special-length drills. Straight-shank drills can be inserted from the rear of chuck. A series of 50 chucks is available for holding drills of various sizes.

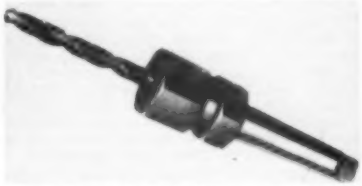


FLOATING TAP HOLDER—*Scully-Jones & Co, 1902 S Rockwell St, Chicago 8, Ill.* The JT floating tap holder, designed for use in multiple-spindle machines, has same double-gear spline-drive coupling for the neutralizing or intermediate driving member.

DRILL JIG—*Esco Engineering Corp, 1940 E Woodbridge St, Detroit 7, Mich.* A reduced version of the "Mijit" drill jig, called the "Jr Mijit," is being made for work on electronics, instrument, and appliance parts. It is self-clamping in any position.



TOOL CHUCKING—*Scully-Jones and Co, 1901 S Rockwell St, Chicago 8, Ill.* Roll-Lock mandrels, arbors, and chucks use a new principle to create a rigid and accurate centering or shrink fit (accurate to less than 0.001 in.) which allows transmission of the maximum given torque and thrust. In either internal or external chucking only rolling friction has to be overcome.



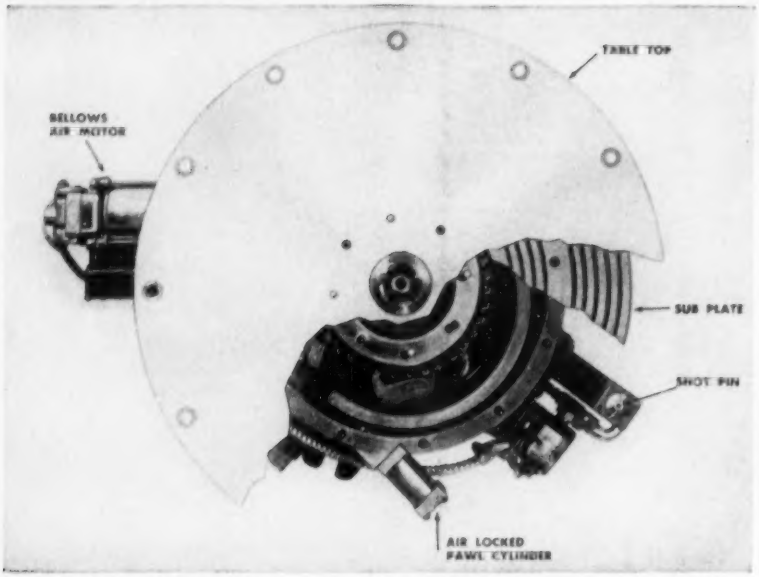
STUB DRILL CHUCK — *Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* For use in multiple-spindle heads, these chucks project a minimum distance and use short drills so that bushings and bushing plates are not required. They must be supported in rigid, true-running spindles.

DRILL CHUCK — *Precision Products Co, 76 Rogers St, Branford, Conn.* Albrecht is a three-jaw chuck with a runout measured in ten thousandths. Drill slippage is eliminated by the self-tightening action of the chuck which matches gripping power to the load. Imported from Germany.

DRILL STOP — *Scully-Jones & Co, 1902 S Rockwell St, Chicago 3, Ill.* Drill stop is used on turret lathes, drill-presses, and radial drills for operations where close control of depth is required. It will stop on fixture bushing or work.

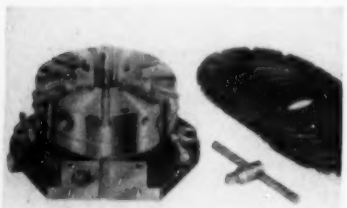
BUSHING CEMENT—*Sheridan Products, 1054 E Hyde Park Blvd, Inglewood 3, Calif.* For the construction of aircraft and other jigs which require accurate positioning of drill bushings, B-K No. 7 cement holds the bushings without distortion of the jig plate.

SAW GUIDE — *Carter Products Co, 9601 Michigan Trust Bldg, Grand Rapids 2, Mich.* Designed to hold saw blade rigidly and close to the work, guide is standard equipment on the Delta-Crescent band saw machine. It assures max support of twist and thrust loads because micrometer adjustment on the jaw block may be made while the machine is in operation. Available for ¾, 1¼, and 1¾-in. saw widths.

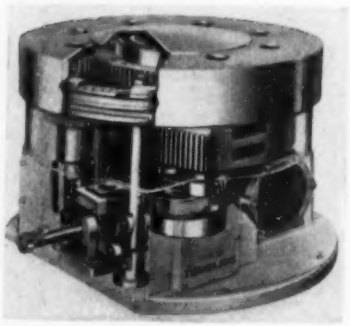


INDEX TABLE—*The Bellows Co, 230 W Market St, Akron, Ohio.* Rotary index table (Model BRET-26) has a 26-in.-dia table top that is set to index either 6, 9, or 18 stations with repeat index accuracy ± 0.001 in. on the table top. Tables with additional positions can be supplied on special order. The table comes complete with air motor.

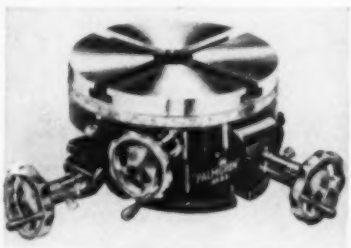
ROTARY INDEX TABLE—*Web-Aire Products Div, H G Weber & Co, Inc, Kiel, Wis.* Mounted on large ball bearings with hardened steel stops. All moving parts are enclosed. Model illustrated is air-operated and 9 in. in dia. It is carried in stock with other sizes special.



INDEXING DEVICE—*Hartford Special Machinery Co, Hartford 12, Conn.* Called the 12-in. Super-Spacer, this rapid indexing device is said to eliminate expensive jigs and fixtures. It comes complete with a 48-notch master-index plate, a set of eight mask plates, for 2, 3, 4, 6, 8, 12, 16 and 24 divisions, and a T-handle socket wrench.

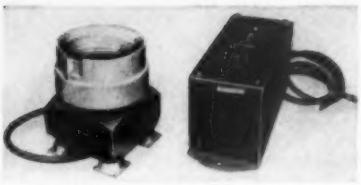


INDEXING TABLE—*Turner Bros Inc, 2625 Hilton Rd, Ferndale, Mich.* A mechanical index table, Hautau-Turndex, is said to be able to move heavy loads from station to station within 3/5th sec indexing time. Standard units are available from 2 to 26 stations in any equal division of 360°.

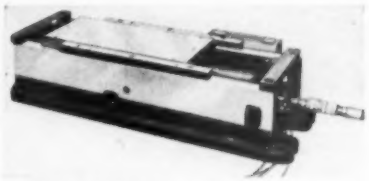


ROTARY TABLE—*Chicago Tool & Engrg Co, 8383 S Chicago Ave, Chicago 17, Ill.* Palmgren No. 83 has a circular table 8 in. in dia with a ⅝x¼x1-in. T-slot. Unit is precisely graduated for the full 360°, 4-in. cross-feed movement.

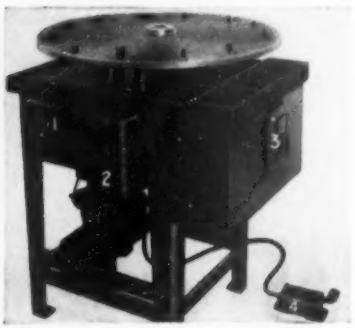
ROTARY TABLE—*South Bend Lathe, South Bend 22, Ind.* Rotary table designed for mounting small precision work can be used on a drillpress, milling machine, shaper or surface grinder. The 4½-in. dia table is rotated by worm gearing with a graduated collar and ball crank. Each graduation indicates a table movement of 3 min.



PARTS FEEDER—*Syntron Co, 311 Lexington Ave, Homer City, Pa.* Model EP-OO has been added to the line of vertical vibratory parts feeders. It lowers the minimum part length in diameter that can be handled from 1¼x¼ in. diameter to ½x1/6 in. diameter. It is furnished with cast aluminum or sheet steel bowl and separate controller.

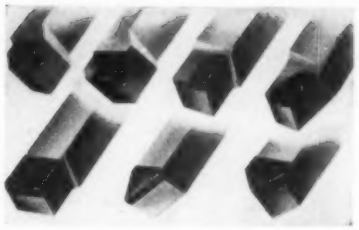


WORK FEEDER — *The Bellows Co, 230 W Market St, Akron 9, Ohio.* Two-station, electrically controlled, air-powered work feeder consists of a movable steel table top guided between hardened and ground dovetail ways. Power for transverse motion of table top is supplied by air motor with built-in Electroaire valve.



MULTI-PURPOSE TURNTABLE — *Eisler Engineering Co, Inc, 750 S 13th St, Newark 3, NJ.* Motorized unit can be supplied with from 6 to 48 positions. Designed for various production lines where requirements call for turning the work spindle, rotating the spindle, and starting and stopping at various positions; many operations can be placed on the particular spindle in accordance with requirements.

ROTARY TABLE—*Kenco Manufacturing Co, 5211 Telegraph Rd, Los Angeles 22, Calif.* Twelve-inch rotary table is made of a suitable casting for greater strength and has four longitudinal T-slots. Top is graduated from 0 to 360 deg and the dial is graduated in minutes.



CARBIDE TOOLS — *Super Tool Co, 21650 Hoover Road, Detroit 5, Mich.* A complete line of standard carbide-tipped tools for turning, boring, facing, and threading are stocked with Carboloy and Kennametal, as well as other leading makes of carbide.

TOOLBITS — *Novi Tool and Machine Co, 43043 Grand River Ave, Novi, Mich.* Novi slotted sleeve simplifies putting in toolbits in boring bars, toolholders, and cutter heads. For rectangular toolbits, two sleeves are installed with the slots facing each other. Available in sizes for toolbits from 3/16 to 1 in. in width and 1 to 4 in. in length.

TOOLBITS—*The du Mont Corp, Greenfield, Mass.* Toolbits are made of a special HSS with a balanced carbon and vanadium content. They are offered in squares with both ends beveled 20° in nine sizes, from ¼ in. square by 2½ in. long to 1 in. square by 7¼ in. long.

CUTTING TOOLS — *Illinois Tool Works, 2501 N Keller Ave, Chicago 39, Ill.* Illinite includes a complete selection of standard end mills, saws, milling cutters, key-slot cutters, hobs, and shaper cutters, gear-measuring blocks, toolbits, and die files.

CUTTING CARBIDE—*Greenleaf Corporation, 512 Franklin Avenue, Wilkinsburg, Pittsburgh 21, Pa.* This new carbide is known as Grade S-6, has its greatest tool life at speeds slower than those for most other carbide grades. It is therefore especially suitable for use on old or slow-speed machines. It is also claimed to be excellent for interrupted cuts.

TOOLBIT — *George F. Kirkelie Co, 8717 Darby St, Northbridge, Calif.* Toolholder, with component boring adapters, fits all standard engine and turret lathe. Vertical adjustment of toolbits can be made without the moving of bits in their holders.

CARBIDE-TIPPED CUTTERS—*Continental Tool Works Div, Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Cutters for milling the airfoil form of stainless-steel jet compressor blades have been developed. They are equipped with the grade of carbide that has proved best in long production runs.

DIAMOND CUTTER — *Industrial Branch, H P Preis Engraving Machine Co, Hillside, N J.* For use in marking hardened and ground machine-tool parts and dies are made with diamonds faceted to a sharp point.

DIAMOND CUTTERS—*H P Preis Engraving Machine Co, 16 Industrial Branch, Hillside, N J.* These cutters are made with diamonds faceted to a sharp point— thus, with the cutter rotating at high speed, a clear mark to a depth of 0.005 in. can be made in hardened tool-steel parts.

MILLING CUTTERS—*Nelco Tool Co, Manchester, Conn.* Line of stagger-tooth side milling cutters have carbide tips with a Tri-Helix grind said to fold the chips away from the work permitting high table feeds and heavy cuts in difficult steels. The cutters are available for cutting slots between ⅜ and 1⅝ in. wide.

UNIVERSAL MILLING - CUTTER BODIES—*McCrosky Tool Corp, Meadville, Pa.* McCrosky universal face mills and shell-end mills are said to be economical for both short and long runs. The shanks of the blade are round, and the holes for the blade and a blade-locking-wedge overlap radially on center in the alloy-steel body. This provides space for up to 4 times as many blades as the cutter dia if extremely fine pitch is desired.

SIDE MILLING CUTTER — *Detroit Milling Cutter Co, 28625 Grand River Ave, Farmington, Mich.* 9-in., 18-blade staggered-tooth side milling cutter designed to mill a 1½-in.-wide slot in an armor casting. Solid-carbide blades have ⅛-in. radius ground on each corner and when dull can be simply indexed to another cutting position. Eight indexes in all are possible, with size being maintained within 0.001 in.

END MILLS—*Metal Removal Co, 1546 N Orleans St, Chicago, Ill.* A line of end mills and die-sinking cutters is available from factory stocks in a wide range of standard sizes; single and double end; small and large diameters; 2, 3, or 5 flutes; straight or spiral flutes; straight or ball ends.

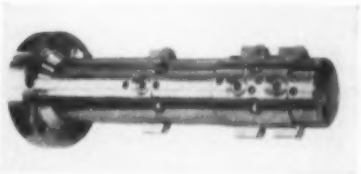
MILLING CUTTER — *Millet Div, Kraus Design, Inc, 950 Exchange St, Rochester 8, N Y.* Carbide-tipped milling cutter has interchangeable blades with tail end seated against an abutment in the body. Cutting forces are transmitted through this abutment. Bodies can be bladed for straight or alternate blade slotting, or halfside milling.

MILLING CUTTER—*Kennametal Inc, Latrobe, Pa.* The Style KF Kennamill is designed primarily for steel production milling runs where adequate horsepower is available, and where intermittent or narrow cuts are encountered. The cutter has only four different parts: body, blade, wedges, and nuts. The Style KF is made in four cutting diameters: 6, 8, 10, and 12 in., either right- or left-hand.

END MILL—*Goddard & Goddard Co, 12282 Burt Road, Detroit 23, Mich.* Can be used for general purpose end milling, keyway slotting, and profiling. Serra-tip end mills can be adjusted through inserted cross-lock blade construction. Blade adjustment makes possible accurate maintenance of size, maximum use of carbide life, and maintenance of chip space.

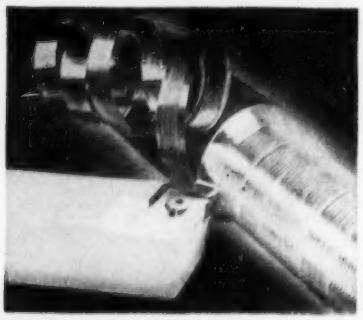
END MILLS—*Precision Products Co, 76 Rogers St, Branford, Conn.* These mills have a unique rake design and are built of 12.5% tungsten steel to provide smooth cutting and maximum service.

MIDGET MILLS—*Severance Tool Industries, Inc, Iowa St, Saginaw, Mich.* Available grouped together in a set of popular ¼-in. shank high-speed mills, supplied in a wooden tool block for convenient storage and handling. There are seven midget mills in the set, all with ½-in. dia cutting heads.



BORING TOOL—*Davis Boring Tool Div, Giddings & Lewis Machine Tool Co, Fond du Lac, Wis.* Tool used to bore hub wheels used on railroad cars eliminates problems caused by the cored openings which tend to deflect bar travel and unusual machine wear because of such deflection. Holes up to 12 in. dia can be bored.

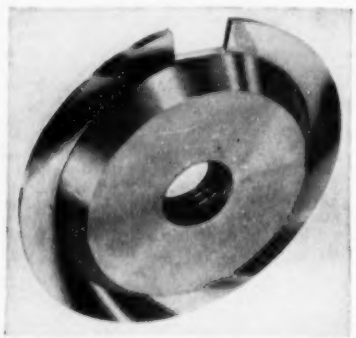
STOP-COUNTERSINK — *Severance Tool Industries, 726 Iowa St, Saginaw, Mich.* Micrometer Stop-countersink is available with a non-rotating head and positive-lock adjustment in 1/1000-in. increments. Method of fastening unit to the operating gun reduces overall length, bringing overhang to a minimum for close-quarter work. Cutter has full-range adjustment from zero to max counter-sinking depth.



TURNING TOOL—*The DoAll Co, Des Plaines, Ill.* Clamp-on turning tool, Hefti-Cut, can take heavy cuts when turning facing, shaping, and boring large diameters. Any standard blanks can be used in the tool.

INDEXABLE LATHE TOOL—*Detroit Milling Cutter Co, 28625 Grand River Ave, Farmington, Mich.* Futurblade utilizes same blades as used in the company's milling cutters, thus permitting standardization for both milling and turning operations. Entire shank size is beneath the solid carbide cutting blade; both the latter and the seat on which it rests are finished to gage block flatness.

GROOVING TOOL—*Waldes Kohinoor, Inc, 47-16 Austel Pl, Long Island City 1, NY.* Waldes Truarc grooving tool is a fully automatic instrument designed for precision cutting of internal grooves. It can be used with drill presses, lathes, or hand machines equipped with chucks or collets.



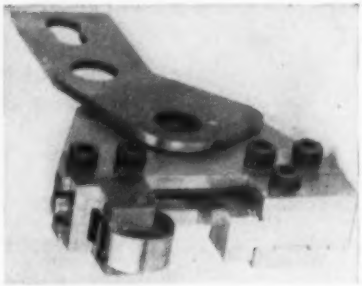
CUT-OFF TOOL—*Gay-Lee Co, Clawson, Mich.* Tool for B & S automatics provides strong support of the solid carbide blade. The steel hub and deep-seating blade are brazed to form a single, permanently bonded unit. The tool is gashed to provide two cutting edges.

CIRCULAR CUTOFF TOOL—*Cir-Cut Div, The New Britain Machine Co, New Britain, Conn.* Cutoff tool is a semi-circular disc of HSS with the cutting surface in the periphery, similar to what would result were it possible to take a conventional straight cutoff tool and bend it into a half-round with its cutting edge on the outer dia.

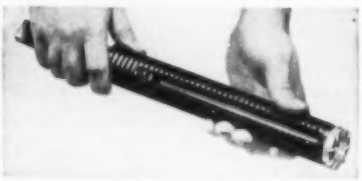
PRESSURE RELIEF GROOVE—*R L Schmitt Co, 6536 Roosevelt, Allen Park, Mich.* Unit added to solid tungsten carbide internal grinding or cutting tools, lengthens life by relieving the pressure which constantly builds up in operating a tool at high speed. Reduces possibility of breakage of cutting edges of tool; also affords greater chip clearance. May be applied to all ID carbide tools.

CARBIDE-TIPPED REAMERS — *Super Tool Co, 21650 Hoover Road, Detroit 13, Mich.* A new method of grinding permits rough and finished reaming and burnishing in one operation. The reamer is ground 0.005 in. to 0.010 in. undersize the first half inch and builds up to finish ream size. Above the finish ream section, lands are circular ground for burnishing to produce a micro finish.

REAMER SETS—*Lavallee & Ide, Inc, Chicopee, Mass.* These sets range in size from a set of 11 helical die-makers reamers No's 1 thru 60. Sizes through 5/16 are ground from the solid. All reamers have external centers and ground flutes.



CIRCULAR SHAVING TOOL—*Jersey Mfg Co, 401 Livingston St, Elizabeth, N J.* The Little Shaver will fit the standard circular form-tool holder or the back slide on a B&S automatic screw machine.



CARBIDE DRILL — *Tilden Tool Co, San Clemente, Calif.* Core drill using eight tungsten-carbide cutters is claimed to hold size of a hole seven hundred times as long as three- and four-fluted standard high-speed drills. These drills are made in sizes from ¾- to 4-in. in dia and up to 36 in. in length.

HARD STEEL DRILL—*Nelco Tool Co, Manchester, Conn.* Nelco hard steel drill has a solid carbide slug sandwich-brazed to an alloy steel shank in a V-notch to assure exceptional torque strength when drilling heat-treated steel. Torque of driving is not dependent upon the braze, but on the manner in which the carbide is held by the shank.

CARBIDE DRILLS—*Super Tool Co, 2165 Hoover Rd, Detroit 13, Mich.* Carbide drills in the "Super Hard" line are now made in eleven sizes, ⅛ to ½ in., in the standard round shank style with solid carbide end, and ten sizes, 5/16 to ¾ in., in the hex shank style with carbide tips.

TAPS—*Hy-Pro Co, New Bedford, Mass.* Hy-Pro machine screw taps are designed for special work requiring oversize taps and units with stronger spiral point. Each designed to handle a particular threading requirement. Available in five flute plastics; three- and two-flute aluminum and zinc die cast metals, and alloy steels; all in standard sizes.

SLITTING SAW—*Gay Lee Co, 71 W 14-Mile Road, Clawson, Mich.* Circular seat on these thin saws is said to produce a braze which holds tips as securely as in cutters many times the thickness. Saw is available in thickness down to 0.030 in., the tolerance held to 0.002 in. and in dia up to 5 in.

HOLE-SAWS—*Miller Falls Co, Greenfield, Mass.* Using a specially selected high-speed steel edge welded to an alloy-steel back, these gang cutting tools are capable of fast, clean cutting in any machinable material. The complete line includes 40 saw sizes ranging from ⅝ in. to 4½ in., 3 sizes of driving mandrels equipped with ¼-in. high-speed pilot drills, and a 12-in. mandrel extension.

SAWS—*Rockwell Tools, Inc, 1314 Kinnear Road, Columbus 8, Ohio.* Tungsten-carbide-tipped circular saws, 6 in. to 36 in. in diameter, cut materials which are difficult or impossible to cut with a saw of ordinary steel. The cutting tips are chisel-faced, cut on both sides of the kerf, and taper back from the cutting edges. They are without set.

SAW BAND—*DoAll Co, Des Plaines, Ill.* A positive rake angle at the tooth tip, gives the tooth a hooked, claw-like characteristic. The hooked teeth actually pull into the material, affording freer cutting; also, less feed pressure is required.

HIGHSPEED HAND BLADE — *W O Barnes Co, Inc, 1267 Terminal Ave, Detroit 14, Mich.* Only the teeth of the blade are hardened; back is semi-hardened to retain flexibility. All-purpose tool can be used for cutting a wide variety of metals and shapes.

CIRCULAR SAW — *Henry Disston & Sons, Inc, Philadelphia, Pa.* Circular metal-cutting saw, called the Disston Chromos, has segments locked together by flexible tightening pins instead of rivets. Available in dias from 11 to 63 in., with various tooth spacing for cutting any ferrous or non-ferrous metals.

METAL-SLITTING SAW — *North American Products Co, 3103 W Cherry Street, Milwaukee, Wis.* These carbide-tipped metal-slitting saws are applicable for complete roughing and finishing, slitting and grooving operations on steel, cast iron aluminum and other non-ferrous materials. The blades will take production cuts in cast iron 6¾ in. deep and steel 2¼ in. deep, and have held size to 0.002 in. on slots 4½-ft long.

CARBIDE COMMUTATOR SAW — *Gay-Lee Co, Clawson, Mich.* Saw has a brazed ring which forms a part of the hub, making hub and solid carbide blade completely bonded and rigid.

CHIP BRUSH—*Detroit Milling Cutter Co, 28625 Grand River Ave, Framington, Mich.* Work-hardened chips on cutters can be removed during a cut by a rotating wire brush that contacts the cutter teeth. A ball-and-socket rod set in a magnetic base supports the brush in any angle or contact required.

WHEEL — *Norton Co, Worcester 6, Mass.* Designed for use on right-angle portable grinders, this wheel is made of carded web material impregnated with abrasive grain. Known as the BFR, it will be used to smooth down welds, blend surfaces on contours, and notch risers in castings.

GRINDING WHEEL—*US Rubber Co, Rockefeller Center, New York 20, N Y.* This cup grinding wheel has a hard shell of resin-bonded abrasive built around a resin-abrasive core. Over-all dia is tapered from 6 in. to 4¾ in., thickness is 2 in.; it is available for three standard types of arbors.

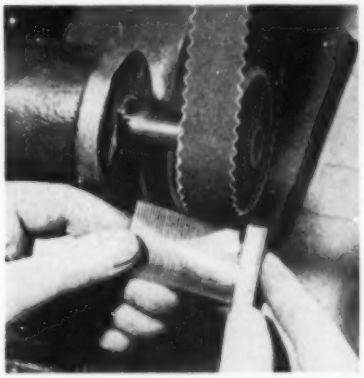
GRINDING WHEELS—*Bonded Products & Grain Div, Carborundum Co, Niagara Falls, N.Y.* R3 rubber wheels for grinding ball-bearing raceways provide free-cutting action, minimizing generation of heat. Because of the versatility of the bonded wheels, only two grain types are employed — one that meets more grinding requirements, and the other intended for use in special production conditions.

WHEELS—*Bay State Abrasive Products Co, Westboro, Mass.* Silicon carbide grinding wheels with standard plate mounting for carbide tool grinders are made in three sizes: 14 x 4 x 11 in., 10 x 2 x 7 in., 6 x 1 x 4 in. Operated with light wrist pressure under steady coolant flow, these wheels are said to finish grind carbide single point tools as fast as diamond wheels.

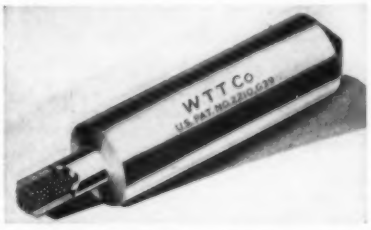
RUBBER-CUSHIONED ABRASIVES —*Brightboy Industrial Div, Weldon Roberts Rubber Co, Sixth Ave and N 15th St, Newark 7, NJ.* For burring, finishing, cleaning, and polishing are available in the Brightboy kit assortment No. 80A. The small wheels and cylinders, totaling 44 pieces in sizes most frequently used with light power equipment, including a chuck and mandrel, retail for $3.60.

GEAR GRINDER WHEELS — *Crown Tool & Supply Co, 155 Bell St, Chagrin Falls, Ohio.* Worm face profiled gear grinder wheels in popular gradings and pitches are being marketed by Jerpbak-Bayless Co. Accurately formed with proper root clearances, minimizing root crushing; require minimum dressing.

POLISHING BELT—*Minnesota Mining & Mfg Co, 900 Farquier St, St Paul 6, Minn.* 3M "Wetordry" polishing belt is designed primarily as a glass edge-polishing tool, though it can be used on ceramics, metal, and plastics. Granulated cork rather than mineral grains are sized with resin combined with a polishing agent. It is designed to replace conventional buffing wheels and cork set-up wheels.



ABRASIVE BELT—*Minnesota Mining & Mfg Co, 900 Fauquier St, St Paul 6, Minn.* Known as the 3M abrasive belt, it is designed for automatic precision grinding and finishing of jet-turbine and compressor blades in a single operation. The scallops of the belt curve around the edges of the contact wheel, allowing fillet areas to be polished on the edge.



DRESSING TOOL — *Wheel Trueing Tool Co, Detroit, Mich.* Diamond-grit tool is available in models for thread-grinding machines that grind V or straight-line threads either for production or gage work. A cutting face is presented in any position, and only occasional turning is needed for effective dressing work.

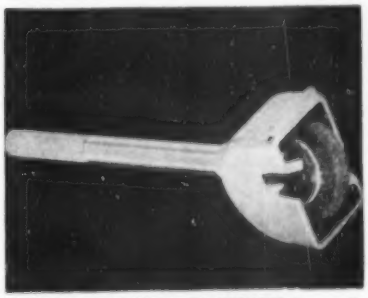
DRESSERS — *National Diamond Laboratory, 108 Fulton St, New York 38, N Y.* Standard line: a cluster set in a high-chromium-titanium bond, a J & L thread-grinder dresser set in the same bond, a diamond boring bar for the turning and boring of cemented carbides.

RUBBER-CUSHIONED ABRASIVES —*Brightboy Industrial Div, Weldon Roberts Rubber Co, Newark, N J.* Brightboys are made for both machine and manual use in wheels, sticks, rods, and blocks. Surfacing is controlled by pressure and/or speed of the piece against object being finished.

DIAMOND DRESSERS — *Diamond Products, 332 Prospect St, Elyria, Ohio.* Line includes round, square, and octagonal units straight, form and profile which will dress every type and size of grinding wheel. Tools can be used in either a vertical or horizontal position.

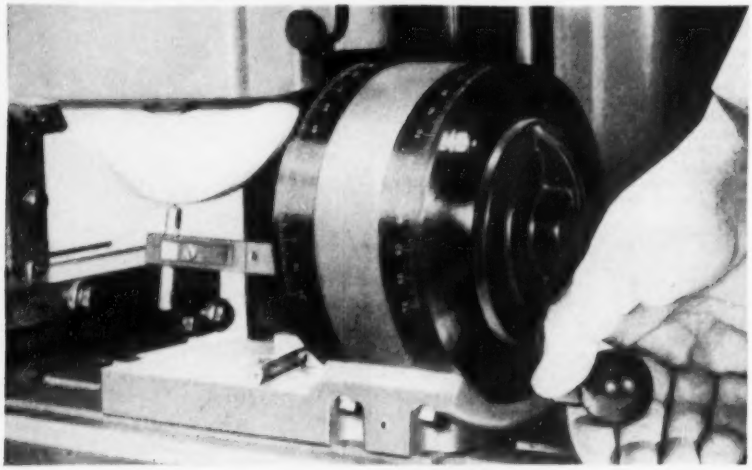
EMERY-WHEEL DRESSER—*L Newman, 1001-24th St, Oakland 7, Calif.* This unit employs a spindle-mounted emery wheel to dress grinding wheels. It is reported to free the bond and eliminate checks in the grinding wheels.

DIAMOND WHEEL DRESSER—*Monarch Machine Shop, Inc, Madison, Wis.* Red Flash wheel dresser is for wheels up to 2¼ in. wide. A 12-carat diamond (as furnished with the dresser) will handle wheels up to 8 in. dia by ¾ in. wide.

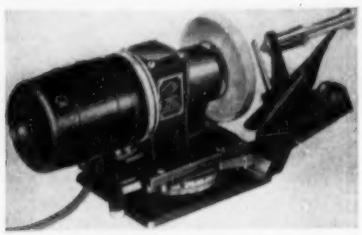


EMERY WHEEL DRESSERS — *L Newman, 1001 24th St, Oakland 7, Calif.* Model 24 utility hand dresser, equipped with precision, sealed ball bearings is said to be perfectly balanced for hand use on bench or pedestal grinders. Model 25 is designed for use on cylindrical grinders with either a straight or tilted table.

DRESSER—*J & S Tool Co, E Orange, NJ.* This under-wheel equipment can be adapted to cylindrical, internal, and tool and cutter grinders. It will form two angles tangent to a radius in one continuous motion with an accuracy to 0.0001 in. without use of dovetails.



WHEEL-TRUEING ATTACHMENT—*Brown & Sharpe Mfg Co, Providence 1, R I.* This attachment is designed to form, with one continuous movement of the diamond, accurate radii on grinding wheels with tangents at either or both sides of the radii. Convex radii up to ½ in. with tangents up to ⅝ in. in length, at any angle from 90° above horizontal to 23° below, and concave radii from 5/32 to 1 in. having tangents up to ⅝ in. long at any angle, from 90° below horizontal to 20° above, can be formed.



DIAMOND WHEEL DRESSER — *Eastern Tool Co, E Hartford, Conn.* The Etco dresser mounts directly on the grinder worktable and will dress the wheel for radii, periphery, and angles from + 0.00025 to − 0.0005 in.

WHEEL ADAPTER — *Detroit Milling Cutter Co, 28625 Grand River Ave, Farmington, Mich.* The adapter is mounted on a standard periphery diamond wheel. When the wheel wears on one edge, it can be reversed on the spindle without returning the wheel. The adapter is designed for No. 2 Brown and Sharpe and similar machines having a 1-in. spindle with 3 in./ft. taper, and has a lockwasher to prevent loosening.

DRESSER — *Desmond-Stephan Mfg Co, Urbana, Ohio.* Belt-brasive dresser removes glazing and loading from the belt, and exposes more particles for effective grinding, sanding, or polishing results. Dresser can be used on either horizontal belt polisher or upright belt grinder, among other applications.

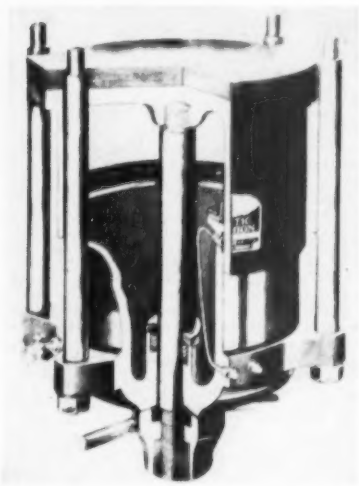
CONTACT WHEEL—*Chicago Rubber Co, 2620 Clybourne Ave, Chicago, Ill.* Universal T-54 contact wheel with available spare rubber tires is designed to reduce cost of wheel replacement. Complete assortment of tires with a wide variety of surfaces for different grinding operations.

GRINDING-WHEEL MOUNT—*Chicago Wheel & Mfg Co, Chicago, Ill.* Mounting for portable-tool and tool-and-cutter wheels is claimed to dampen vibrations with the following advantages: better finishes, greater wheel life, and reduced operator fatigue.

DIAMOND RECLAMATION — *Diamond Dust Co, 15 W 44 St, New York 36, NY.* An electro-chemical process has been developed for reclaiming all types of diamond containing material. After a free analysis of a two-lb sample of sludge or swarf, owner is advised of its value. Reclaimed diamond powder can be returned, or owner may request payment for it.

PUNCH, DIE, AND STRIPPER — *Porter Precision Products Co, PO Box 99, Cincinnati 31, Ohio.* Combines punch, die, and stripper in a two-piece unit which can be readily fastened to any plate press or pressbrake to handle short-run punching jobs. Known as the AC, the unit features a dual-button assembly which allows compressed air to blast the punched slug out of the die.

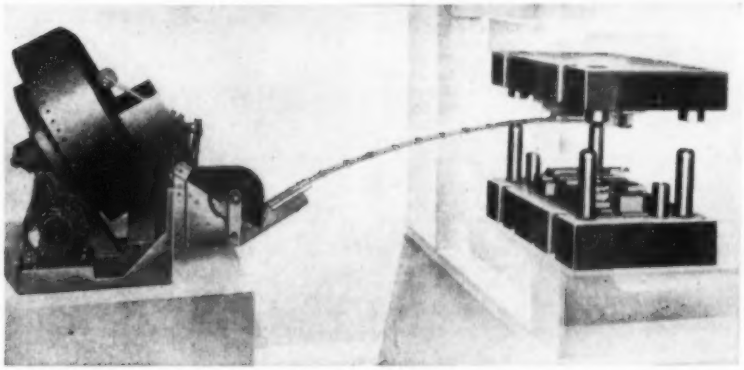
HYDRAULIC STRIPPING — *Wales-Strippit Corp, 345 Payne Ave, North Tonawanda, NY.* Utilizing the compressibility of special fluids, these Hydra-Springs are said to provide six times the stripping pressure of ordinary coil springs of similar size. Stripping pressures may be adjusted by adding or reducing the volume of Comproil.



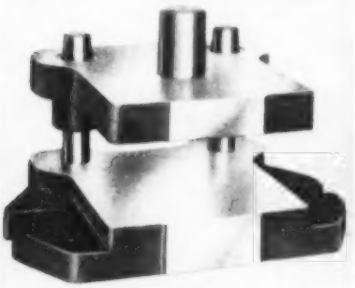
DIE CUSHIONS—*Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Semi-steel die cushions are designed to keep weight at a minimum while reinforcing critical stressed sections. All cushions operate from standard air pressure, and come equipped with a combination reducing regulating valve and pressure gage.

HOLE-PUNCHING UNUITS—*Wales Strippit Corp, 345 Payne Ave, N Tonawanda, N Y.* The heart of these units for punching holes in mild steel up to ¾ in. thick is the Wales Hydra-Spring, which provides many times more stripping pressure than mechanical springs of the same volume.

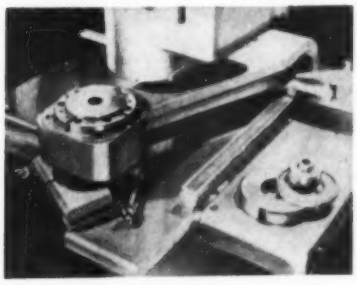
HEAVY DUTY PUNCHES — *Richard Brothers Div, Allied Products Corp, Detroit, Mich.* The series employs a ¾-in. ball lock in the punch retainer, providing increased stripping capacity. The lock gives positive radial alignment without the use of other keying devices.



PUNCH AND DIE-BUTTON SETS—*Allied Products Corp, Detroit, Mich.* Available to pierce and clinch a nut with one stroke of the press. Clinch-nut insertion is performed by an interchangeable magnetic punch and mating die button. The nut itself does the piercing and is held magnetically to the bottom of the punch.



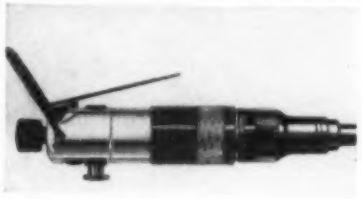
DIE SETS—*The Producto Machine Co, Bridgeport, Conn.* Greater strength is obtained in these sets, with every contour planned to keep weight at a minimum while reinforcing all critical areas.



PUNCH HOLDER — *Wales-Strippit Corp, North Tonawanda, N Y.* For use with interchangeable punches and dies on Wales sheet-metal fabricators. It fits into the bed channel and does not have to be removed during interchanging. Rapid setups and faster output of parts requiring larger-dia holes is made possible by the holder.

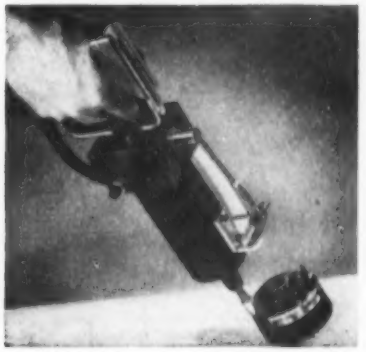
HOLE-PUNCHING UNITS — *Wales-Strippit Corp, 335 Payne Ave, N Tonawanda, N Y.* Wales Type-H hole-punching units are designed for punching holes in flanges, angles, container sides, and similar shaped and formed work. Punching holes in the side of the work instead of on top of the flat surface is possible because the punches move horizontally.

ELECTRIC SCREWDRIVER — *Dremel Mfg Co, Racine, Wis.* Smaller Model SD-1 drives free-running screws or nuts from No. 0 to No. 4, inclusive; the larger SD-2 is for sizes No. 4 to No. 8 inclusive. Model SD-1 weighs 12 oz, is 4¾ in. long, with a driver-bit speed of 1200-1400 rpm. The SD-2 weighs 18 oz, is 6½ in. long, with a driver-bit speed of 1400-1600 rpm.



SCREWDRIVERS, NUTSETTERS — *Aro Equipment Corp, Bryan, Ohio.* Reversible screwdrivers and nutsetters are available in two models, one with an adjustable clutch, the other with a positive clutch. All tools are equipped with ¼-in. hex head holder, ⅛-in. air inlet. A bit, a finder and wrenches are furnished.

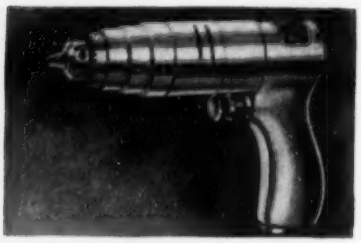
PORTABLE PNEUMATIC WRENCH —*Independent Pneumatic Tool Co, 175 N State St, Aurora, Ill.* Thor ¾-in. portable pneumatic reversible impact wrench features rolling ball cam, and is available with two types of spindles: sizes 24, with ½-in.-sq drive, and size 24S, with a 7/16-in. hexagon quick-change chuck integral with the spindle.



NUT RUNNER—*Garvin Bros Inc, PO Box 536, South Bend 24, Ind.* The Model MA-25 nut runner is able to control torque in the zero to 25 in.-lb range. Special gearing is available to extend this range to 40 in.-lb.

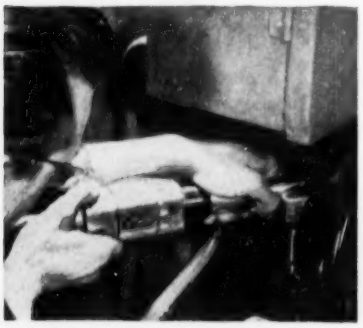
MULTIPLE NUT RUNNERS—*Ingersoll-Rand Co, 11 Broadway, New York, NY.* Multiple nut runners mounting standard or altered nut runners in clusters, positioned and spaced to suit the work. The time savings obtained are in direct proportion to the number of nuts or cap screws to be run.

ELECTRIC DRILL — *Cummins Portable Tools, Div of Cummins-Chicago Corp, 4740 N Ravenswood Ave, Chicago 40, Ill.* Model 115 drill has a ⅜ in. chuck and a swivel-ball side handle for two-handed operation. Its recommended capacity is ⅜ in. in metal, ⅝ in hard wood.



AIR DRILL—*Burklyn Co, 3429 Glendale Blvd, Los Angeles 39, Calif.* DeKay pneumatic air drill uses 12 cu. ft. of air per minute under full load and will deliver 21 foot-ounces of torque. Models are available in pistol grip, straight, and 90 deg. right angle extension drill types of ¼ in. capacity. Speeds are 2200 to 15,000 rpm with an 18,000 rpm precision grinder with collet chuck.

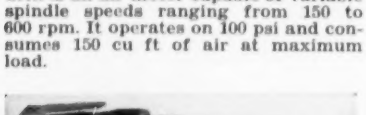
DRILLS — *Porter-Cable Machine Co, Syracuse 8, NY.* Two electric hand drills with ¼-in. chuck and ½-in. capacity special duty mold. Model 107 drills within ¾ in. of a parallel surface; model 109 drills within 1¼ in.



DRILL—*Mall Tool Co, 7740 S Chicago Ave, Chicago 19, Ill.* Small, compact angle head on this pneumatic drill permits work in close quarters. Head can be swiveled to any position relative to the throttle by simply loosening a single nut. Built-in air regulator allows variable-speed ranges on the air motor, while a built-in automatic oiler eliminates the need for line oiling.

PORTABLE DRILLS—*Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* A new line of ¼-in.-capacity portable electric drills has a free drilling speed range of 600, 800, 1000, 1750, 2500, 3500, or 5000 rpm; pistol grip, spade handle, and center contour handle designs are available.

PORTABLE DRILLER—*The Guibert Steel Co, Pittsburgh, Pa.* Togglebug drill is an air motor capable of variable spindle speeds ranging from 150 to 600 rpm. It operates on 100 psi and consumes 150 cu ft of air at maximum load.

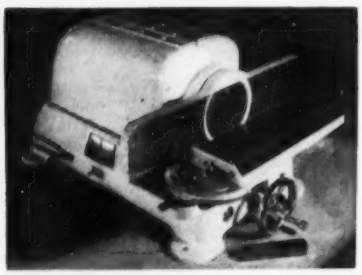


DIE GRINDER—*Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* This 1¾-lb pneumatic die grinder has a 4-vane rotary motor, adjustable to various speeds, a speed regulator, and quick-action lever throttle. Eight sizes of Erickson collets are available.

GRINDER-MILLER — *Precise Products Co, 1328 Clark St, Racine 1, Wis.* This multi-purpose, electrically powered grinder-miller turns at controllable speeds from 15,000 to 45,000 rpm. It uses a ¼-hp motor and can be adapted to grinding, milling, and finishing. Work can be finished to tolerances within 0.0001 in.

PNEUMATIC GRINDER — *Mall Tool Co, 7725 S Chicago Ave, Chicago 19, Ill.* This short grinder is claimed to be extra-powerful for its size and weight. The tool is equipped with Erickson precision collets, and has a maximum 0.0015-in. arbor runout. Weight is 18 oz. length 5¼ in.

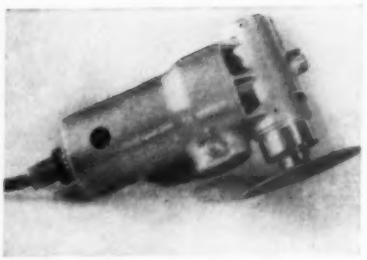
HAND GRINDERS—*Skilsaw Inc, 5033 Elston Ave, Chicago 30, Ill.* Three powerful hand grinders are for use with mounted wheels and points. Model 137 is equipped with a 5/32-in.-capacity geared chucks and has a speed of 20,000 rpm. Model 146 comes with ⅛- and ¼-in. collet chucks. Model 148 has a speed of 36,000 rpm and ⅛- and ¼-in. collet chucks.



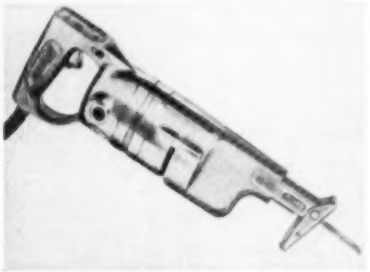
HAND GRINDER — *Southwest Machine Works, 1309 Bridge St, Albuquerque, NM.* A 5-in. cup wheel protrudes slightly through the stationary fence along which the work is moved. Its uses include facing flat valves, straightedge knives, connecting rod caps, small dies, and numerous castings. Fence dimensions are 3¼ in. wide, 4½ in. wide and 18 in. long. Net weight is 216 lb.

NIBBLER ATTACHMENT—*Mall Tool Co, 7740 S Chicago Ave, Chicago 19, Ill.* Designed for cutting all kinds of thin metal such as sheet steel, brass, copper, or fiber up to 19 gage. Width of cut is ⅛ in., and easily handles close detailed work. Attachment uses a high-speed punch cutter; operates with any ¼-in.-capacity standard or heavy-duty electric drill, at speeds from 800 to 3500 rpm.

NIBBLER—*Fenway Machine Sales Co, 20 S 15th St, Philadelphia 2, Pa.* Portable nibbler cuts through 14-gage stainless steel, CRS, galvanized iron, and softer materials without distortion on either side. Little Wonder nibbler also cuts holes in tubes and ducts without damaging original contour. Minimum cutting radius is ⅞ in.

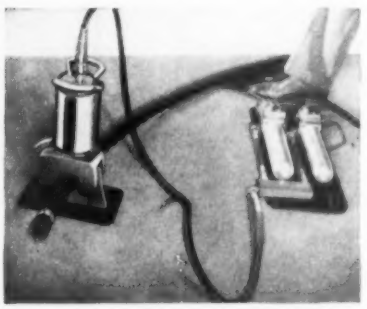


DISK GRINDER—*Balmar Corp, Baltimore 11, Md.* A high-speed disk grinder, 9 in. long, weighing only 4½ lb and designed for one-hand operation.



POWER SAW — *Milwaukee Electric Tool Corp, 5316 W State St, Milwaukee 8, Wis.* Milwaukee Sawzall has a ¾-in. stroke and operates at 2250 spm. The reciprocating sawing tool cuts through wood, transite, galvanized sheet, and other metals, wire, nails, Formica, Masonite and many other materials.

GUILLOTINE—*Manco Mfg Co, Bradley, Ill.* A thumb-button unit for cutting steel rod up to ½-in. in a ¼-second cutting cycle. Unit exerts up to 20 tons thrust from portable hydraulic pump.



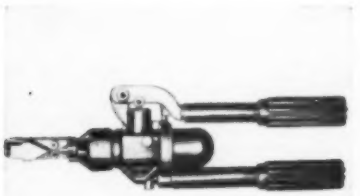
WIRE-ROPE CUTTER — *Manco Mfg Co, Bradley, Ill.* Series-15 guillotine is a latch-type wire rope cutter with cutting time as low as 7 seconds. Unit exerts up to 50 tons thrust, cutting up to 1¾-in. wire rope. The tool is available with a variety of electric and air-hydraulic pump assemblies.

POWER REAMER—*Joseph E Murphy Co, 24 Ellsworth St, Worcester 3, Mass.* Three-speed reamer can be used for reaming, chamfering, and as a high-speed horizontal tapping unit when equipped with a tapping head. It can be also used as a lapping and honing unit. Reamer capacity is up to a 1 3/16 in. reamer. Motor is 1/3 hp 110-120 volts, 60 cycle, single phase, hinge mounted, and can be equipped for dc and odd frequency.

FLEXIBLE-SHAFT MACHINE — *Wyzenbeek & Staff, Inc, 223 North California Ave, Chicago 12, Ill.* Known as the Wycomatic, it is offered in three sizes: 1/3, ½, and ¾ hp and in two speed ranges, infinitely variable from 1200 to 3600 and from 2000 to 6000 rpm. Straight handpieces or angle heads to fit the unit are provided with a quick-change coupling.

ANGLE ADAPTER — *Huck Mfg Co, 2480 Bellevue Ave, Detroit 7, Mich.* One person from one side of work can drive 1/8-, 5/32-, and 3/16-in.-dia self-plugging, or pull-through blind rivets in a clearance space of only 4 in. The adapter fits into a Huck No. 93 air riveting tool or a No. 94 hand tool.

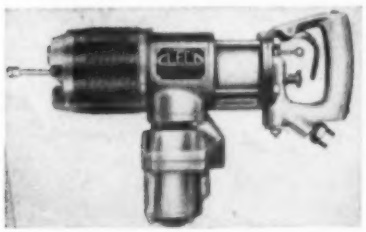
STAKING TOOL—*Thomas & Betts Co, 16 Butler St, Elizabeth, N J.* Designed to operate on regular shop air pressures of 75 to 150 psi, this tool puts two tons of pressure behind the installing dies. It is direct coupled, without toggle links, pivot pins, levers, or cams.



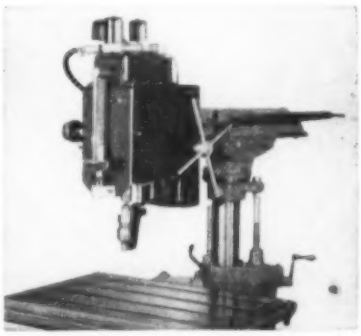
HAND-OPERATED HYDRAULIC CUTTER—*Manco Mfg Co, Bradley, Ill.* Only 12 lb in weight and 21 in. long, this hydraulic cutter cuts up to ½-in. reinforcing rod with ease. Feature of the cutter is a pressure of 8500 psi exerting 10-tons thrust in a hand-operated unit.

RETRACTABLE CORDS — *Koiled Kords, Inc, Box K, Hamden, Conn.* For handling portable tools to eliminate wire kinking. Neoprene jacketed, the cords are permanently coiled into a spring-like shape that extends up to six times its length, and retracts.

POWER-SCREWDRIVER BITS — *Ludwig Hommel & Co, 73 First Ave, Pittsburgh 22, Pa.* A complete line of ¼-in. hex drive and threaded-shank bits for slotted, Philips, Frearson or Reed and Prince screws.



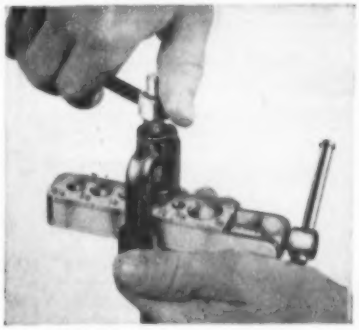
COUNTERSINKERS—*Cleco Div, The Reed Roller Bit Co, 5125 Clinton Drive, Houston, Tex.* Air tool countersinks a ¾-in. hole in 75-ST aluminum in 9 sec. It has only two controls, one for clamping the tool to the work and one for rotation.



TORQUE TOOLS — *Garvin Bros Inc, PO Box 536, South Bend, Ind.* Because torque range exceeds strength of the operator, the MA-500 air-driven tool needs to be mounted. Controls torque to within 2% of prescribed limits. There is no need for subsequent hand inspection and scrap is drastically reduced. Tools are available with air-powered, standard or high-cycle motors.

AIR DRILL—*Keller Tool Co, Grand Haven, Mich.* 11C series of three angle-type drills are powered to drill holes in aluminum or brass from 9/16 in. up to ¾ in. dia, and in mild steel from ½ to 11/16 in. dia. Fifteen variations of speed and chuck size are available to meet any requirement accurately within stated range.

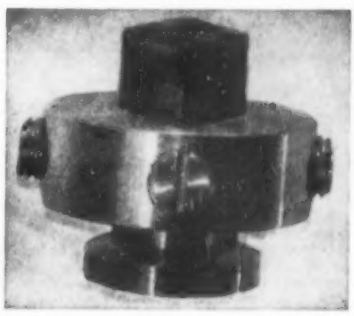
RATCHET WRENCH — *Keller Tool Co, Grand Haven, Mich.* To reach into inaccessible places, this air-driven ratchet wrench has an open end to tighten or remove unions, junctions and couplings. Thumb-operated stop plate automatically stops the wrench in open position. Two sizes handle hex nuts from ⅜ to ⅝ in. across flats.



FLARING TOOLS — *Imperial Brass Mfg Co, 1200 W Harrison St, Chicago 7, Ill.* Make 37° flares on soft steel, copper, aluminum, and fully annealed stainless steel tubing. Wide range of sizes of tubing can be flared with a single, compact, lightweight tool. Automatic burnishing mechanism provides highly polished finish to face of the flare after it is formed.

HYDRAULIC PULLER — *Owatonna Tool Co, 383 Cedar St, Owatonna, Minn.* Three-arm puller, adapted to hydraulic power. Power-Twin ram and OTC 3-arm Grip-O-Matic puller need only a special three-way head to convert to hydraulic operation.

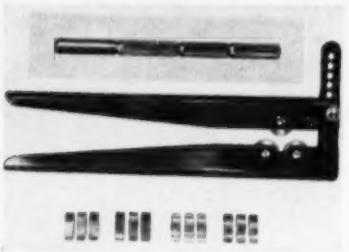
SAFETY CHISEL GRIP—*Rose Mfg Co, Denver, Col.* This strap and handle unit avoids bruised fingers when handling a chisel. It is adjustable and made in two sizes to take the vast majority of chisels, punches, marking dies, star drills, etc.



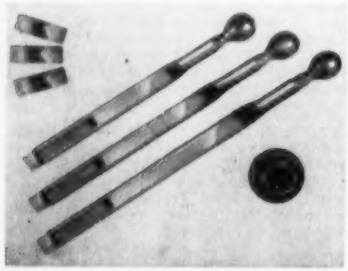
TORQUE-CONTROL ADAPTER — *Overload Control Co, 260-63 Langston Ave, Glen Oaks, L I, N Y.* Adapter can be attached to any make socket or ratchet wrench. The unit is mounted between the wrench and the desired socket. When a nut or bolt is tightened, it will automatically disengage when the predetermined torque is reached.

JOINT PLIERS — *Utica Drop Forge & Tool Corp, Utica, N Y.* Claimed to be extra strong because the ribbed joint is forged. There is no machining of the joint itself. The steel-fiber structure, because it is completely intact and not cut is claimed to withstand maximum stress and strain. The pliers are known as the Model 507-10.

PLIERS—*Utica Drop Forge & Tool Corp, Utica, N Y.* With compound-leverage, and parallel-action of the jaws. The tools are priced at $3.26 list with cutter and $2.20 without cutter. Length is 6½ in. in both sizes.



HAND-OPERATED KNURLER — *M P A Co, 1678 W 17th Place, Los Angeles 6, Calif.* May be used with a lathe, drill press, or with work held in a vise. Adjustable, it will accommodate parts ranging from 5/32 in. to 2 in. in diameter, knurling any length desired.



HAND SCRAPER — *Anderson Bros Mfg Co, 1907 Kishwaukee St, Rockford, Ill.* This hand scraper for flat surfaces is constructed of seamless tubing which makes it light in weight with just the right flexibility. It is available with Carboloy-tipped blades.

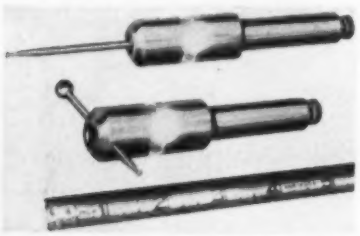
SAFETY TONGS—*Atlas Welding Accessories Co, 707 Lewiston St, Ferndale 20, Mich.* Safety tongs are made of drop-forged steel with long, broad nose members to provide a firm grip. The nose members are thin at the tip, making them useful for removing blanks from presses.

CHAIN PULLER—*Owatonna Tool Co, 383 Cedar St, Owatonna, Minn.* Built especially for use with the OTC 17½-ton hydraulic ram. It comes equipped with a 3 ft, 3720-lb proof test, ⅝-in. chain with a grab hook on one end. Self-centering hook with a screw adjustment permits a straight, even pull without cocking.

SAFETY HAMMER — *Universal Machine Co, 109 W Pleasant Ave, River Rouge, Detroit 18, Mich.* The head is a tough homogeneous casting of copper or copper alloy which will flatten, but not fracture or chip. It is molded on the end of a light-weight, tubular-steel handle.

SOFT-METAL HAMMER — *Custanite Corp, Larchmont, N Y.* For die and fixture setup, has a serrated cross-section, resulting in tooth-like projections inside the head. The teeth compress toward each other during use of the hammer, which prevents mushrooming.

TANG BREAK-OFF TOOLS — *Heli-Coil Corp, Danbury, Conn.* For the removal of inserting tangs on helical-wire thread inserts, tools operate on the principle of a spring-loaded center punch. The tools remove tangs quickly without disturbing the inserts.



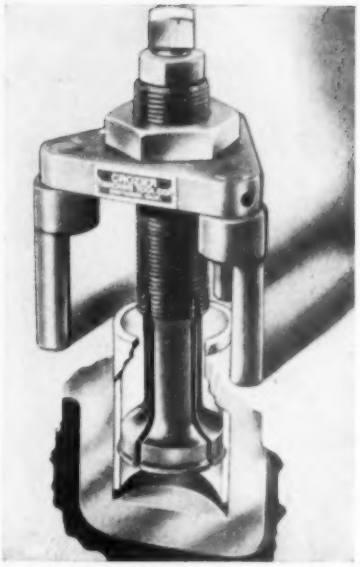
CENTER FINDER—*Art-Mil Machine & Mfg Inc, 170 Hosack St, Columbus 7, Ohio.* This Art-Mil Center Finder is a single-cell battery-operated device that lights up when the point desired is located.

MITERING TOOL—*Lander & Abbott, La Crescenta, Calif.* Various dies are available for this hand mitering tool, made of hardened-and-ground tool steel. Mitering, notching, slotting of unhardened steel up to 1/32 in., and metals like copper and aluminum up to 1/16 in., can be done.

DRIFT—*The Custanite Corp, Box 66, Larchmont, N Y.* Has a pin to attach the head to the handle, a special alloy which can't chip, flake, or spark, and a special stepped-hollow construction which prevents mushrooming.

CABLE CUTTER — *Thomas & Betts Co, 16 Butler St, Elizabeth, N J.* Heart-shaped design of the jaw opening results in clean, accurate cuts free from jagged ridges across the center of the cable. The cutter can be used on both bare or insulated copper or aluminum cables up to 500,000 CM. Outside insulation dias can be up to 1½ in.

PLASTIC MALLETS—*Matticks Manufacturing Co, 4156 E Pacific Way, Los Angeles 23, Calif.* Includes seven models with head weights varying from 1 oz to 14 oz, head dia between ¾ in. and 2 in., head lengths between 2¾ in. and 4 in. Heads are of tough, resilient cellulose plastic.



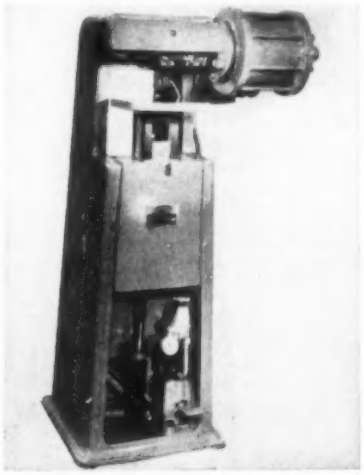
BUSHING EXTRACTOR — *Crozier Machine Tool Co., 684 N Prairie Ave, Hawthorne, Calif.* Bushing and bearing extractor for blind holes consists of eight threaded expanding arbors, a draw table with two sets of legs. They can handle any hole from ½ in. to 2 in. dia. Max of 2½ in. may be drawn at one setting.

PARALLEL CLAMPS—*Dept 16, Precision TC Co, 1305 S Laramie Ave, Cicero 50, Ill.* A line of toolmakers' parallel clamps is available with openings ranging from ⅝ to 3½ in. They are hardened throughout and have metal clips to hold the screw in place on the return.

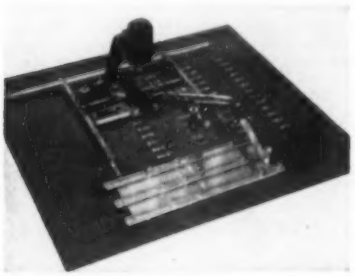
BOLT CUTTER — *Manco Mfg Co, Bradley, Ill.* Portable bolt cutter has a design which permits the cutting blades to be reversed—the blades have a double edge.

ADJUSTABLE PROP—*Lempco Products Inc, Bedford, Ohio.* When ram is lifted, slugs pour out of an opening and fall into an outer cylinder to form a solid mass of steel on which ram rests. 10-ton load is supported.

MARKING—*H P Preis Engraving Machine Co, Hillside, NJ.* Master copy dial provides 41 characters for quick change engraving in any machine, and locks with a spring-held ratchet. Preis-Panto model No. 1 is available with ⅜-, ½-, or ¾-in. characters in several styles.



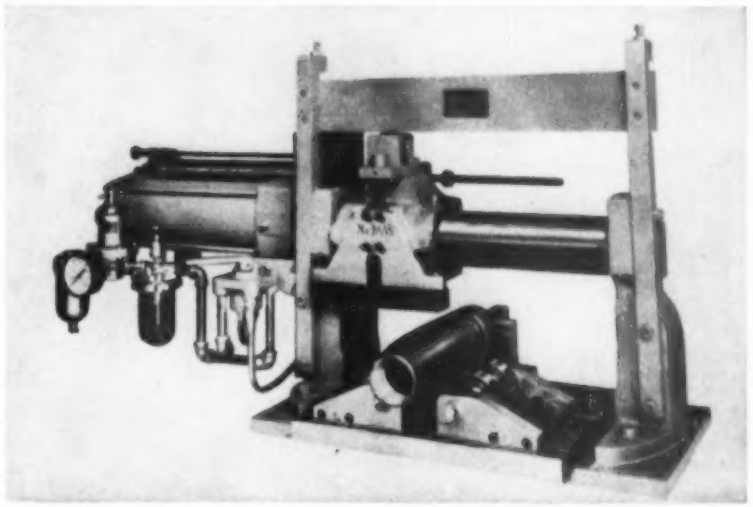
MARKER—*James H Matthews & Co, 3962 Forbes St, Pittsburgh 13, Pa.* This pneumatic marking machine impresses a deep mark on tough metal surfaces without exerting extreme pressures and shock. Head automatically passes the marking die back and forth on the part until the pedal is released.

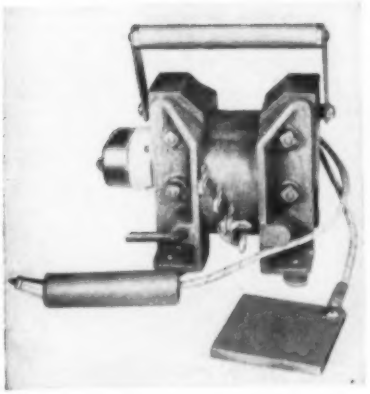


ENGRAVING MACHINE — *New Hermes, Inc, 13-19 University Place, New York 3, N Y.* This engraving machine features a detachable chassis which, when removed from the base, may be easily placed directly on the work surface for precision engraving.

MARKING MACHINE—*The Acromark Co, 7-13 Morrell St, Elizabeth, N J.* A combination complete air-feed and ejector assembly with a motor-driven marking machine, is available for the marking of cylindrical parts. Motor drive is a gear-reduction motor furnished for 110- to 220-v, 60-cycle ac connection.

ROLL-MARKING DIES—*New Method Steel Stamps, Inc, 147 Jos Campau, Detroit 7, Mich.* Roll-marking dies use a standard inclined plane or cam starting pad to secure uniform depth of impression. This also helps the screw-machine operator in tooling setup. The starting pad on the marking roll die should contact the part during the last 3/16 in. forward feed of any screw-machine cam.





METAL ETCHER—*The Mundro Products Corp, PO Box 3911, Detroit 27, Mich.* Red Head etcher is designed to provide a clean, quick method of marking steel parts; including hardened, thin, or delicate pieces. A demagnetizing unit can be added to pick up minute particles and chips adhering to parts because of magnetism.

MARKING MACHINE — *The Acromark Co, 7-13 Morrell St, Elizabeth, N J.* Marking machine for cylindrical parts is motor driven and has an air-feed and ejector assembly. The parts can be brought to the machine by conveyor or by other means and rolled into feeding position down a gravity chute.

ROLLER PRINTER—*Jet Mfg Co, 288 Hyde Park Ave, Boston 30, Mass.* Can be used for coding, striping, indentifying. Prints on large pipe, steel or concrete, edges of glass sheets, striping steel bars, sheet metal, drums, etc. Printing wheels may be changed quickly; special inks can be made to order.

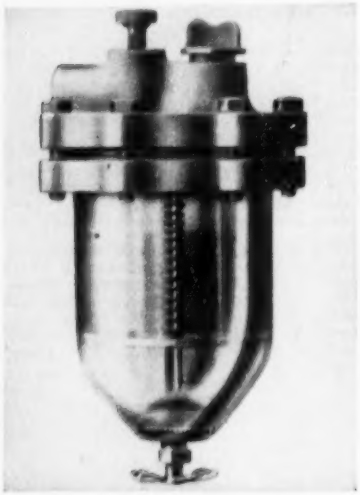
TYPE HOLDER—*The Parker Stamp Works, Inc, Franklin Ave, Hartford, Conn.* Interchangeable steel number and letter sets include a variety of standard size letters. An interchangeable threaded shank is included with each set. This allows changes from hand to press stamps in an instant.

SHELL-MARKING MACHINE—*The Acromark Co, 7-13 Morrell St, Elizabeth 4, N J.* Has been improved so that 50% more markings may be made on each shell. An overhead, horizontal bar has been added to the work-head against which a precision ball bearing rolls to relieve the pressure on the slide marking head. The marking-head holder has been enlarged and provided with set-screw adjustment.

ROLL MARKER—*Noble & Westbrook Mfg Co, East Hartford, Conn.* In addition to completely pneumatic operation, new model features a special electro-pneumatic circuit with an electronic cycle timer which requires the operator only to load and unload piece parts.

MARKING TOOL—*S C & L Machine Co, 1121 Fourth Ave, Rockford, Ill.* Recipro Tool will engrave letters, numbers, or identification marks on any material. It can also be used for riveting, filing, burring, peening, for cutting plastics, shim stock, etc. It delivers 5¼-lb impact. It reciprocates at 7200 power strokes per minute and is adjustable from 0 to ⅛ in. length of stroke.

OILER—*Leiman Bros Inc, 146 Christie St, Newark 5, N J.* Developed to feed automatically measured amounts of oil to Leiman air pumps, the E-113 oiler provides from 1 drop in 4 min to 4 drops in 1 min.

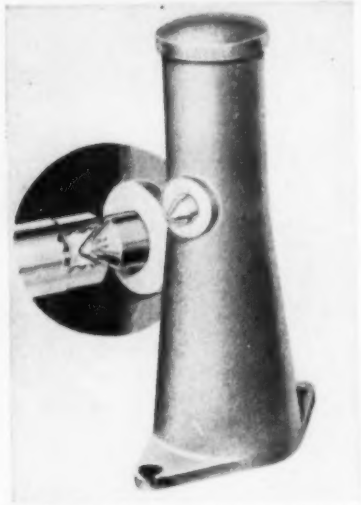


AUTOMATIC AIR OILER—*Robinson and Lee, 347 Madison Ave, New York 17, N Y.* Adaptable to any cfm air flow, the BR automatic oiler feeds a premixed mist of oil and air to the tool or machine at each operational cycle.

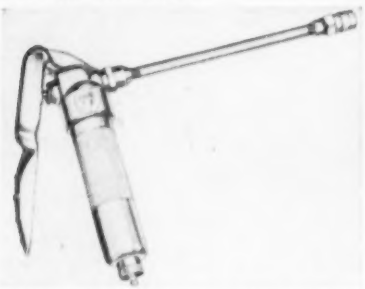
WICK-FEED OILERS — *Oilrite Corp, 2318 Waldo Blvd, Manitowoc, Wis.* Especially suitable for use in dusty surroundings. They are brass bodied, have small capacity, and since they feed filtered oil, dirt cannot reach the bearings.

AUTOMATIC OILING SYSTEM—*Oil-Rite Corp, 2386 Waldo Blvd, Manitowoc, Wis.* Oil-Rite oiling system Style DEI is a single-line gravity-feed system that is entirely automatic in operation. It consists of a central reservoir with a solenoid-operated shut-off valve and a number of individual valves mounted directly into the bearings. A single reservoir will feed up to 24 bearings. They can be supplied in six sizes, ranging from 9 oz to 1 gal.

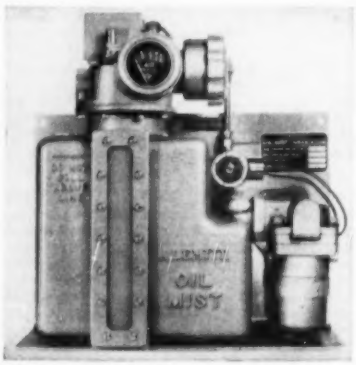
GREASE FITTINGS — *Universal Lubricating Systems, Inc, Oakmont, Pa.* For machinery where protruding heads might be knocked off and impair machine's function. Units are made with a ball check; supported by a spring, ball prevents oil or grease leakage caused by back pressure.



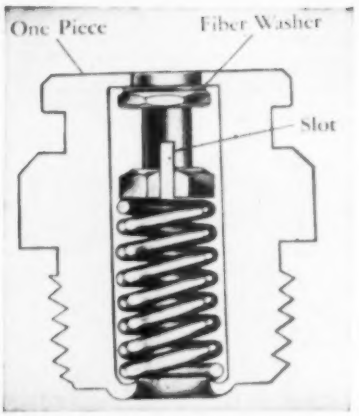
DISPENSER—*H K Tool Co, Waukesha, Wis.* The center-lobe dispenser is a sealed unit, mounted on work bench or machine, for lubricating lathe or grinder centers. Lubricant is sealed in and flushes outward, keeping center free from borings and chips often present with white lead.



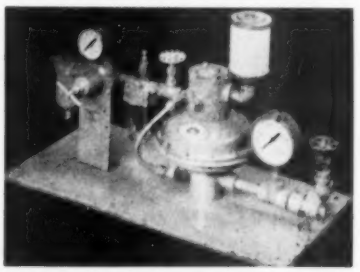
LUBRICATING GUN — *Lincoln Engineering Co, 5754 Natural Bridge Ave, St Louis 20, Mo.* This 2-lb automatic booster gun is designed for lubrication of bearings requiring injection of a small quantity at extremely high pressure, or of limited quantities of special-purpose lubricants. Unit provides complete range of pressures up to 10,000 psi.



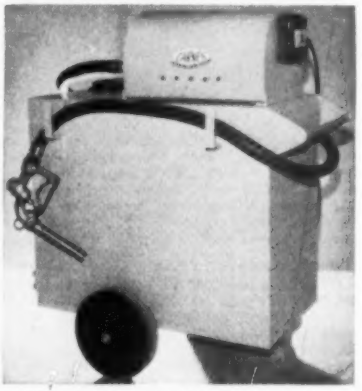
SIGNAL SWITCH — *Stewart-Warner Corp, Alemite Div, 1826 Diversey Pkwy, Chicago 14, Ill.* Oil-Mist lubricators have 1-gal. oil reservoirs and built-in automatic warning switches which signal the operator by horn and red light, or shut off the machine as the oil level becomes too low.



GREASE FITTING—*Universal Lubricating Systems, Inc, 692 Allegheny Ave, Oakmont, Pa.* The Universal giant buttonhead grease fitting prevents the leaking possible with conventional two-piece fittings which can be separated by extreme pressure or jolting. The fittings are available in all regular sizes.

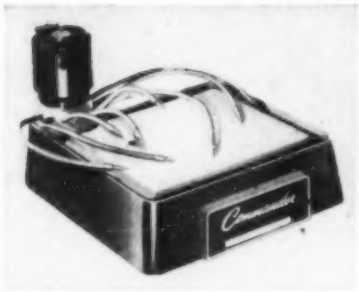


WATER-OIL SEPARATOR — *Honan-Crane Corp., 701 Indianapolis Ave., Lebanon, Ind.* It performs water separation and filtering of solid contaminants continuously and automatically. Cleansing action of the filter and the purifier units permits delivery of thoroughly purified oil.

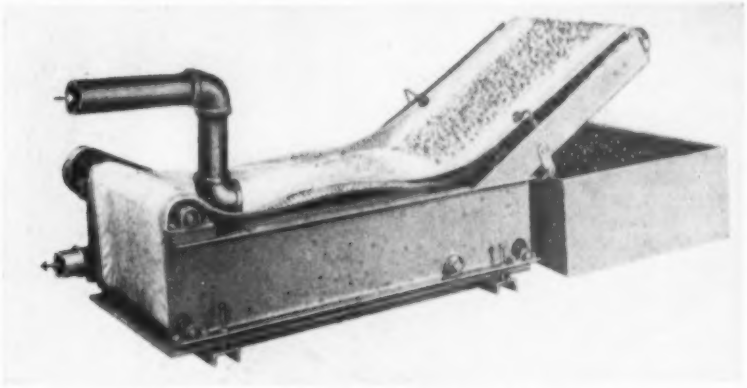


COOLANT DISPENSER—*W R Carnes Co, Verona, Wis.* Model 110-R-4 is an oil and coolant dispensing unit equipped with an electrically driven pump and fourway valve to allow for pumping in or out. Standard unit has a capacity of 75 gal.

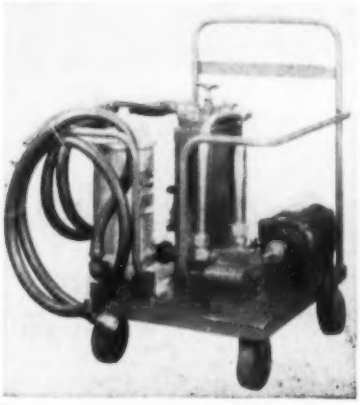
GREASE FILTER—*Air Filter Corp, Milwaukee, Wis.* Specifically designed to remove entrained oil from entering exhaust ducts. This prevents fire hazards and prolongs the life of fan motors and other mechanical equipment.



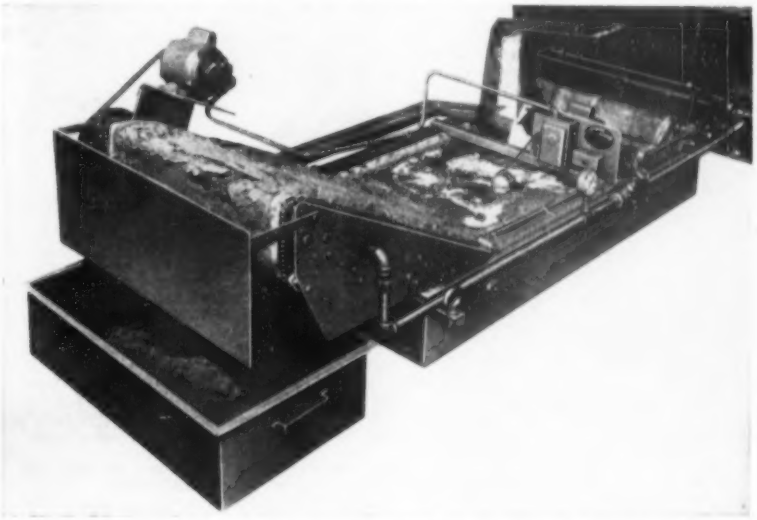
COOLANT TABLE—*Commander Mfg Co, 4221 W Kinzie St, Chicago 24, Ill.* Equipped with a built-in pump and reservoir and eight semirigid, flexible-metal coolant nozzles. Long hose lines and floor units are eliminated by a built-in coolant system. Flow from each nozzle can be individually controlled.



COOLANT FILTER — *Honan-Crane Corp, 701 Indianapolis Ave, Lebanon, Ind.* Automatic Houdaille filter features a self-cleaning, continuously rotating web. Use of the whole filter bed enables this small, compact unit to handle a large volume of coolant. The belt utilizes the same filtering medium over and over. Capacities are from 40 to 500 gpm.



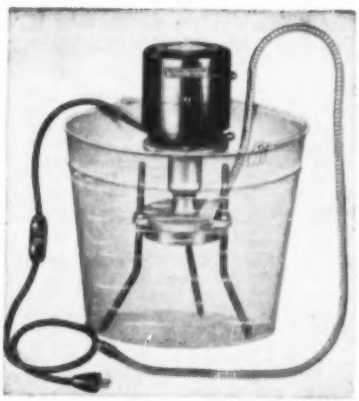
FILTER UNIT—*J N Fauver Co, Inc, 49 West Hancock Ave, Detroit 1, Mich.* Portable unit consists of a Yale & Towne pump, a Cuno Auto-Klean metal-edged filter and a Cuno Micro-Klean which filters out everything to 25 microns. Circulation rate is 10 gpm.



PERMANENT FILTERING ELEMENT—*Permanent Filter Corp, 2309 Riverside Drive, Los Angeles 39, Calif.* Filterall completely eliminates need for cartridge pack replacements. Oil is neither lost through absorption nor slowed up through the filtering element, constructed of carefully sized, spherical-shaped bronze particles fused together where they touch.

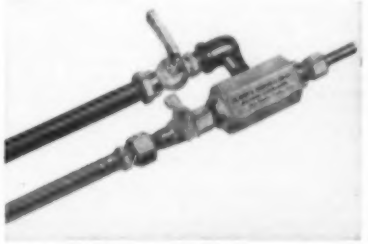
SUMP TANK CLEANER—*W R Carnes Co, Verona, Wis.* Model No. 20-T, series NA, operates on a high vacuum principle; nothing but air passes through the pump unit. Available in 100-, 150-, or 200-gal. capacity, each tank is fitted with a sludge compartment containing a removable 100-lb capacity basket lined with replaceable fabric filter bag which retains solids, such as chips, sludge, etc; clear oil or coolant collects in the storage tank.

FINISHING-CHIP SEPARATOR — *Roto-Finish Co, 3700 Milham Rd, Kalamazoo, Mich.* (P O Box 988) MMG 34-12 is designed to separate both ferrous and non-ferrous parts from Roto-Finish abrasive chips. Unit can be used either as a magnetic or mechanical separator, since the two different mechanisms are interchangeable on the portable frame.

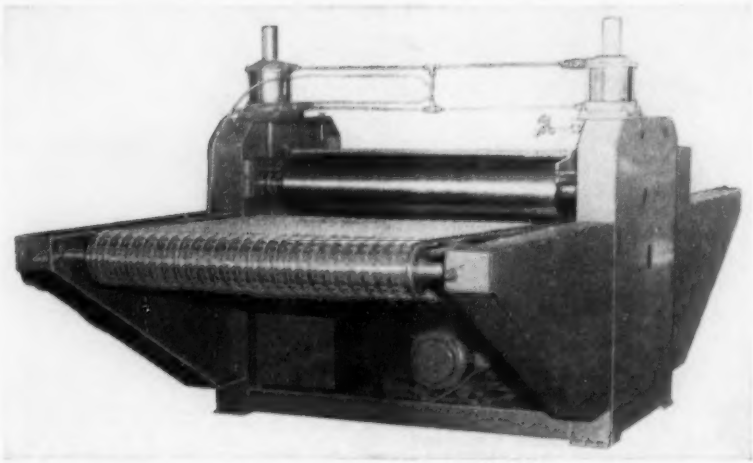


COOLANT SYSTEM — *Factory Tools, Inc, 4706 W Arthington St, Chicago, Ill.* Simplified, low-cost coolant pump and motor assembly is available, which, when immersed in a pail or other container of coolant, becomes a complete coolant system. Unit's built-in, high-volume vane pump, driven by a fully sealed 1/30 hp motor, delivers a steady stream of coolant or oil through the 4-ft-long, semi-rigid flexible metal hose.

FILTER — *Industrial Filtration Co, Lebannon, Ind.* Filter designed to serve individual machine tools or large, central coolant systems. The filter material, in the form of endless belting, rests on a flat, endless conveyor of open construction. Capacities range from 2 gal. per min to units capable of filtering 1000 gpm.



COOLING SYSTEM—*Henry G Thompson & Co, New Haven 5, Conn.* This atomized lubricating and coolant system called Atom-Lube is said to provide longer tool life, faster cutting speeds, and improved cutting quality. System is supplied complete with mounting bracket, 12- and 6-in. matched-nozzle tubes, 4 ft of ¼-in. ID coolant hose, and ¼-in. SPS nipple for air connection.



DIE-LUBRICANT—*Union Tool Corp, Warsaw, Ind.* Roller Coater is equipped with three sets of rolls and with automatic infeed and off-bearing conveyors. Rubber nip rolls convey the work from an infeed conveyor through a set of brush rolls for cleaning, and then through a set of hardened steel coating rolls. Doctor rolls, controlled by a calibrated handwheel with micrometer adjustment, gage the coating thickness.

LUBRICANT — *Tap and Drill E-Z Corp, 11033 Hawthorne Blvd, Inglewood, Calif.* Lubri-Cut is claimed to increase the life of taps, drills, and cutting tools up to 12 times, and to be equally efficient when used on hard and soft ferrous and non-ferrous metals, plastics, or in glass.

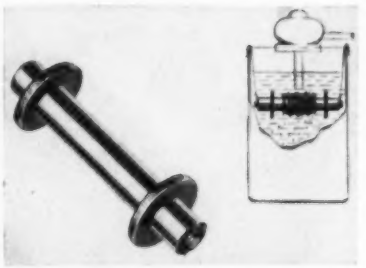
LUBRICANT DIE CUSHION—*Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Excessive wear on die cushions, particularly on the packings, is said to be reduced by this lubricant. Available from stock in 10- and 35-lb pails.

WAX COOLANT—*S C Johnson & Son, Inc, Racine, Wis.* No. 170 used with radial-arm routers, eliminates much of the welding and burring on routed edges. Lubricity of the wax makes it easier for the operator to pull and guide the router. When degreasing is necessary, residual coolant can be removed in conventional vapor degreasers and alkaline washers. Wax is not intended for machines with return coolant systems.

MULTIPLEX LUBRICANTS — *Hood Refining Co, 541 So Pennsylvania Ave, Greenburg, Penna.* Produced in grades from No. 00 to No. 3 have no melting point and retain their lubricity and adhesive characteristics under all temp conditions normally encountered. Insoluable in water, they are plastic or pumpable at temp from −20 F to +15 F depending upon the grade.

OILS, WAXES, AND GREASES — *Chemical Mfg Div, M W Kellogg Co, PO Box 469, Jersey City 3, N J.* Claimed to have excellent high-temperature properties as well as high electrical resistance. They are chemically inert and can withstand virtually any corrosive. Main ingredient of the products is fluorocarbon plastic.

GREASE—*Knapp Mills, Inc. L I City, N Y.* Called Lead-Lube, has a high metallic-lead content in the form of pulverized dust, kept in permanent suspension.



COOLANT-PUMP MAGNET—*Magnetool Div, Multifinish Mfg Co, Dept 304, 211½ Monroe Ave, Detroit 7, Mich.* Low-cost coolant cleaner is recommended for toolroom and light machines. It is not for heavy production grinding. The 1¼-in.-dia by 8-in.-long magnetic unit is suspended under the pump intake in coolant tank.

LUBRICANT — *Ironsides Co, 270 W Mound St, Cleveland, Ohio.* Called Palmoshield, is said to have all the chemical characteristics of palm oil. It looks, feels, acts and handles like palm oil and requires no changes in rolling mill operation for the production of tin plate.

LUBRICANT — *Electrofilm Corp, 7116 Laurel Canyon Blvd, North Hollywood, Calif.* Lubond, an air dry lubricant, operates at temps from 70 to 300 F. May be sprayed or brushed on steel, iron, stainless, lead foil, aluminum, brass, etc. Recommended for hinge pins, hydraulic cylinders, gears, threads, etc.

GREASE—*The Texas Co, 135 E 42nd St, New York, NY.* Texaco Multifak 2, is recommended for use where one multi-purpose grease is needed for a variety of operations. It is claimed to have excellent shear stability, resistance against water washing, and good pumpability at lower temperatures. It is suitable for bearing lubrication over a wide range of temperatures.

WATER-SOLUBLE COOLANT — *Pelron Corp, 7740 W 47th St, Lyons, Ill.* For honing, Pelron No. 560 contains a high percentage of liquid detergents and a rust preventative and is used in concentrations of 15 or 20 to 1, depending on individual requirements. It is non-inflammable, non-volatile, and cleaner in handling.

LUBRICANT—*S C Johnson & Son, Inc, Racine, Wis.* No. 140 Stik-Wax is a stick lubricant for metal sanding, metal sawing, pipe cutting and threading, drilling, tapping, grinding and flush riveting. 1-lb, 2-in. dia product can be applied manually or automatically.

DIE LUBRICANT — *The Metalloid Corp, Huntington, Ind.* Drawing compound X-60 is said to increase production per die dressing up to 8 times by limiting heat generation. Active ingredients unite with the atoms in the work to normalize the stressed section. The material becomes active at 550 F.

COOLANT—*The White & Bagley Co, 100 Foster St, Worcester 8, Mass.* Economy Liquid 1500 is a clean, transparent coolant grinding titanium and other difficult metals. One part of the liquid is mixed with 150 parts of water for most applications.

CUTTING OILS—*Atlantic Refining Co, Philadelphia, Pa.* Non-soluble cutting oils 20 through 45 provide reduced friction, superior cooling, anti-weld and metal wetting characteristics. Soluble oil 1 and 4 are designed for ordinary work, and heavy-duty operations, respectively.

CUTTING FLUID—*Carbide and Carbon Chemicals Co, 30 E 42nd St, New York 17, N Y.* Ucon H-660, a synthetic cutting fluid that forms a solution with all proportions of water at room temperature, is claimed to be exceptionally clear—thus assuring good visibility of the work.

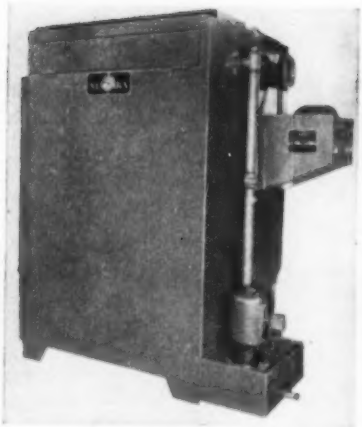
BEARING LUBRICANT — *Texas Co, 135 E 42nd St, New York, NY.* Texaco High Grease is said to considerably extend the efficient range of operation of ball, roller and plain bearings at temperatures up to 300 F for continuous operation, and 350 F for intermittent operation.

CUTTING CHEMICAL—*Phillips Scientific Laboratories, P O Box 152, Arlington, N J.* Mabros 99 Spec. applied to drills and lathe cutting tools is claimed to prevent burrs and scratches—producing a surface so smooth that polishing is not necessary.

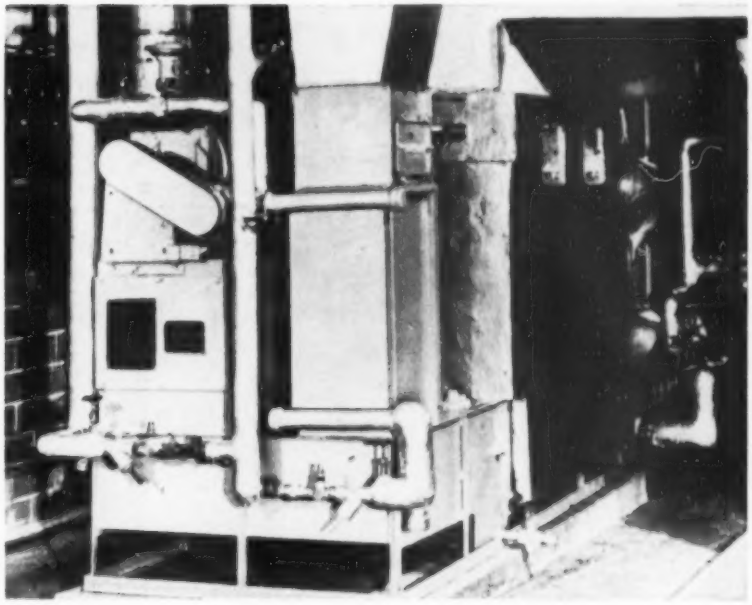
SOLID LUBRICANT—*The DoAll Co, 254 North Laurel Ave, Des Plaines, Ill.* Stick form is used in lubricating cutting tools and threads metal fastenings. Called Tool Saver, it is a special formula of fine wax ingredients. It comes in a pushout cardboard dispenser tube. It is applied by rubbing the pushed-out, exposed portion against the surface or edge to be lubricated. To be used on saw bands, twist drills, taps, reamers, etc.

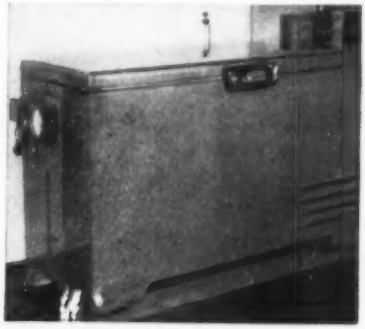
COOLANT — *Master Chemical Corp, 538 Erie St, Toledo 2, Ohio.* Trim is claimed to have solved the problems which accompany bacterial growth in water-base coolants — gumming, corrosion, and objectionable odors. Price in single-drum lots is $2.50 per gal, f.o.b. Toledo, Ohio

CUTTING AGENT — *The Metalloid Corp, Huntington, Indiana.* Sulfur-free metal cutting agent known as X-30 is claimed to increase tool life 400 to 800% and decrease RMS surface finish readings 35 to 50%. Its catalyst is an organic compound said to be non-staining and completely transparent. Any regular paraffin or napthenic cutting oil can be used as its vehicle in ratios as high as 4 to 1.



AIR CONDITIONING UNIT—*Niagara Blower Co, 405 Lexington Ave, New York 17, NY.* Apparatus for drying or moistening of atmospheric air, called Liquid Contact Method, treats air to fix relative humidity and temp independently. Temp or absorbent concentration of the liquid determines moisture content of the air leaving chamber.





LOW-TEMPERATURE CABINET — *Conrad Industrial Coolers, Holland, Mich.* Temperatures produced are in ranges of minus 75, minus 100 and minus 130 F. Refrigerants are freon 13 and freon 22, which will not burn or cause explosions in event of a tube leakage.

FREEZER CABINETS — *Revco, Inc, Deerfield, Mich.* The cabinet is available in two sizes and equipped with a sub-lid to maintain constant temperature. Temperature control is adjustable for any controlled temperature to as low as 90° below zero in the 1.5-cu-ft model in normal room temperature.

DEHUMIDIFIER AND FREEZER—*Kathabar Div, Surface Combustion Corp, Toledo 1, Ohio.* Delivers air at temperatures ranging from 32 to as low as minus 100 F. Known as the Kathabar, this low-temperature package unit provides for an increased air-moisture absorbing capacity through utilization of refrigerants in its cooling coils. Air capacities range from 1350 to 500 cfm.

LOW-TEMPERATURE CABINET — *Revco, Inc, Deerfield, Mich.* Sub-zero chest equipped with a double lid to maintain constant temperature and to minimize heat loss. Temperature can be controlled to as low as 90 below zero F in a 1.5-cu-ft model in normal room temperature and to as low as 80 below zero in the 6.5 cu-ft model.

CHILLING MACHINE — *Sub-Zero Products Mfg Div, Deepfreeze Distributing Corp, Cincinnati 29, Ohio.* The sub-zero W-120 has a capacity of 5 cu ft, and will maintain temperatures as low as 120 deg below zero. It will remove 500 Btus per hour, the equivalent of cooling 20 lb of steel from room temperature to minus 120 F.

CHILLING — *Sub-Zero Products Co, Cincinnati 29, Ohio.* Series XV-120 chilling chambers are designed to obtain temps of –140 F for small-scale production work. Sizes available from 1.5 to 3 cu ft; controlled temp range from –70 F to –140 F. Heat absorption capacity is 250 Btu's per hr at –120 F, normal operating temp. Occupies 7 sq ft of floor space.

CHILLING CHAMBER — *Sub-Zero Products, Cincinnati 29, Ohio.* Effects complete circulation of the convection fluid in the chamber six times per minute, resulting in maximum heat transfer. A 3-blade, 4-in. propeller mixer is enclosed in an 8-in. draft tube, with a 6½-in. clearance at bottom and a minimum of 2-in. clearance between top of tube and fluid level.

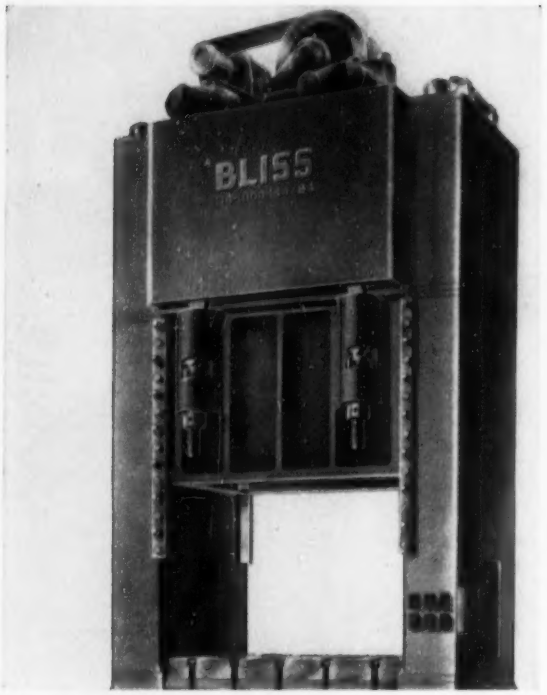
DEHUMIDIFIER — *Dryomatic Corp, Alexandria, Va.* Time-delay action on this dehumidifier means that the drying material is thoroughly dehydrated and cooled before the unit switches back to the drying phase. The self-contained, 24-watt, 1/100-hp rotor fan motor is capable of moving 32 cu ft of air per min.

INDUSTRIAL DEHUMIDIFIER — *Abbeon Supply Co, 179-15 Jamaica Ave, Jamaica, N Y.* This dehumidifier can be supplied in three different ways: 1) Continuous or intermittent operation without automatic control. 2) With an optional plug-in control for automatic operation. 3) With the control built right into the front as a permanent part.

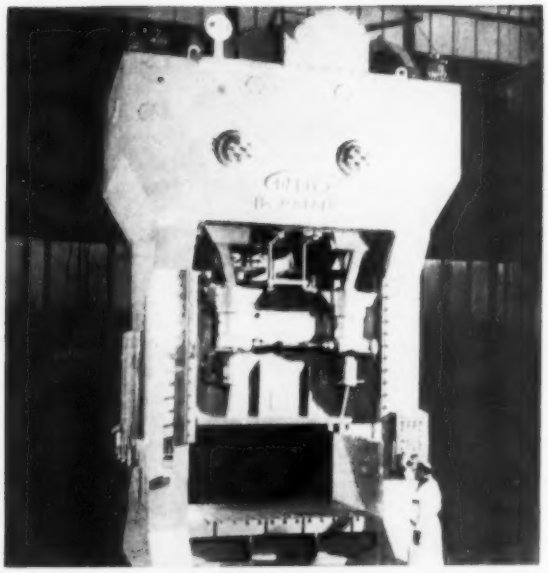
INDUSTRIAL CHILLING MACHINE —*Sub-Zero Products, Cincinnati 29, Ohio.* Model R-70 a chilling chamber 30x18x33 in. deep with more than 22 sq ft of surface. Unit has a thermal capacity of 800 Btu's per hr at —70F, with temperature control adjustable from —10 to —80F.

1953 American Machinist Production Preview

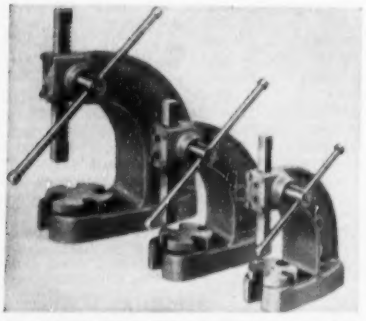
FORMING, FORGING, CASTING



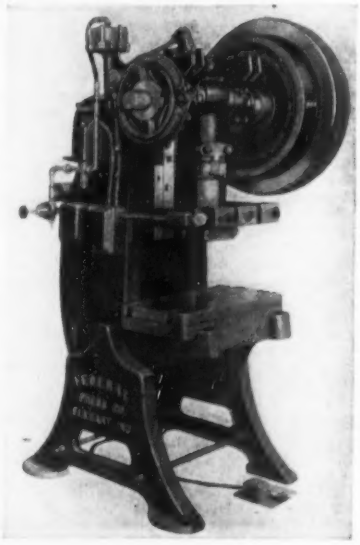
TOGGLE PRESSES — *E W Bliss Co, Canton, Ohio.* A series of 4-point, double-action toggle drawing presses featuring quick advance and return speeds and extreme accessibility. The presses are specially designed to meet the needs of the automotive and allied industries by making possible higher production rates for large-area drawn stampings.



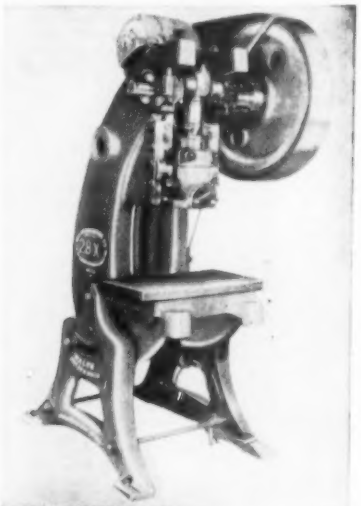
DOUBLE-ACTION PRESS—*Danly Machine Specialties, Inc, 2100 South Laramie Ave, Chicago 50, Ill.* 450-ton double-action, straight-side press is equipped with a Dynamic clutch which varies linear stroking speeds during the press cycle. Unit operates at the rate of 14 spm; slide speed during the effective draw is held to 60¼ fpm.



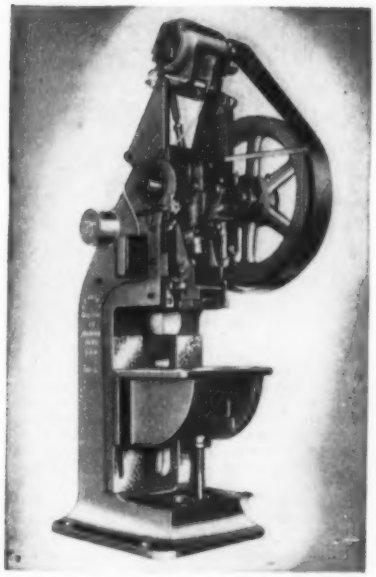
ARBOR PRESSES—*Benchmaster Mfg Co, Los Angeles 6, Calif.* Arbor presses in three sizes have capacity up to 2 tons and work clearance up to 9 in. Base and tapered column cast of semi-steel are rated at a safety factor of 5.



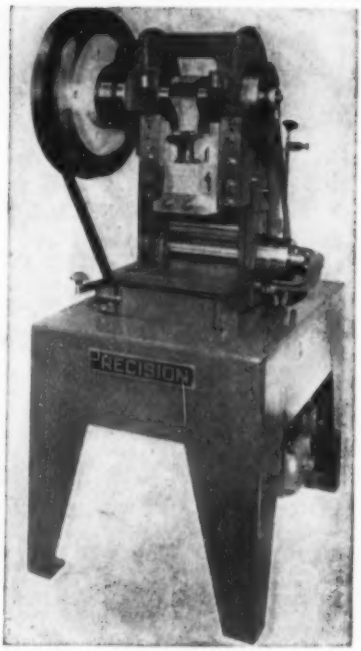
PUNCH PRESS—*Federal Press Co, Elkhart, Ind.* Line of punch presses includes a clutch-brake mechanism known as the Smooth Air which is controlled electro-pneumatically.



PRESS—*Walsh Press & Die Co, 4709 W Kinzie St, Chicago 4, Ill.* This press features precision-ground parts balanced and surface finished to Brush analyzer. Other features are a carefully ground steel crankshaft, hand-scraped bearings, solid web wheel, and gears.

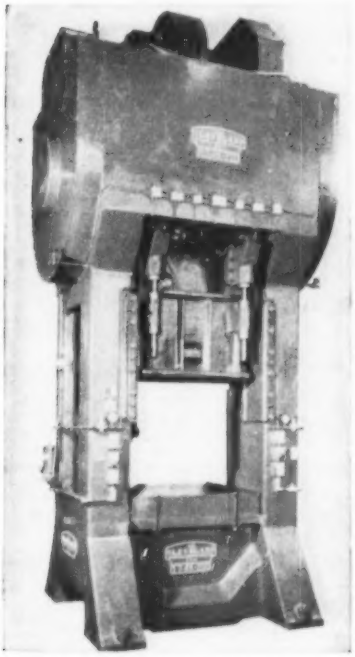


BED HORN PRESS — *Perkins Machine Co, Warren, Mass.* This 45-ton horn press, with a solid or adjustable bed, has a 2½ in. stroke with max adjustment of 7 in. It is equipped with a 38-in. dia flywheel; bed area is 22½ by 26 in.; distance from center of slide to frame, 12½ in.; between gibs, 11½ in.

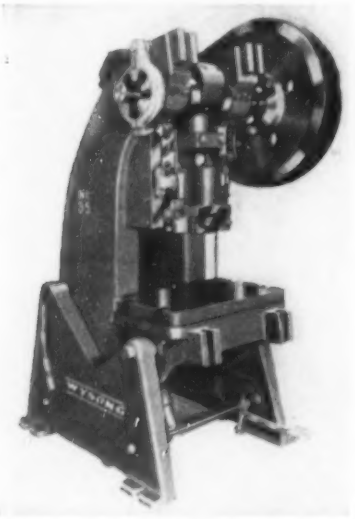


PUNCH PRESS — *Precision Welder and Flexopress Corp, 138 E McMicken Ave, Cincinnati.* Material feeds from rear to front through integral feed rolls on this high-speed automatic press. It is only 7 in. from the rolls to the center line of dies. The rolls are infinitely adjustable for all stock advances between 0 and 9 in. per stroke. Speed is infinitely variable from 150 to 600 strokes per min. Capacities are from 2 to 50 tons.

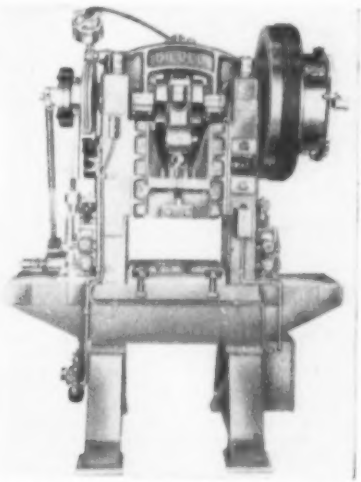
POWER PUNCH PRESSES — *O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* Di-Acro presses No. 1 and No. 2 have a deep throat. Because of this, many operations can be performed on them that could not be done on shallow, bench presses. They will punch a 4-in. dia hole in 16-gage sheet steel, or a ⅝-in. hole in 3/16-in. steel plate.



TOGGLE PRESS — *Cleveland Punch and Shear Works Co, Cleveland 14, Ohio.* Single-crank, double-action toggle press is arranged for twin drive and equipped with a drum friction clutch with spring-loaded brake. Press has a stroke of 20 in., adjustment 10 in., shut height 42 in., bed area of 48x48 in., capacity 200 tons, and operates at 12 strokes per min.

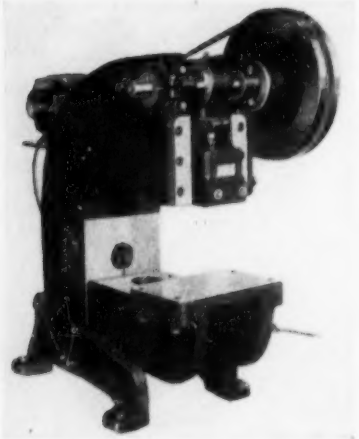


PUNCH PRESS—*Wysong and Miles Co, Greensboro, N C.* Inclinable punch press employs a square-pin clutch with three points of engagement and built-in non-repeat unit. The hardened tool-steel wear plates for the clutch pin are replaceable without removing the flywheel. Die space (from bed to slide), with stroke down and adjustment up, is 12 in.

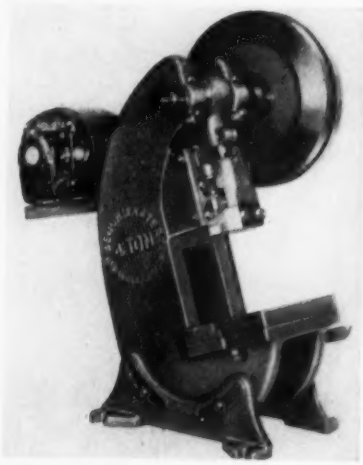


AUTOMATIC PRESS — *Die Machine Corp, 2711 W Irving Park Road, Chicago 18, Ill.* Automatic press, known as the Diebel Di-Matic, can produce intricate piece parts from the most complicated progressive dies because of its extra rigidity.

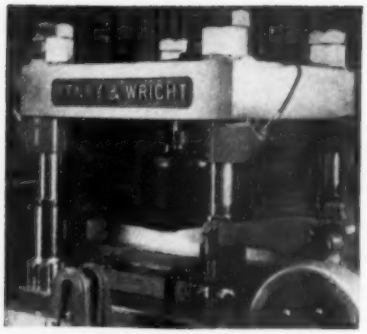
MAGNETIC FEEDER — *Magnetool Div, Multifinish Mfg. Co, Dept 304, 2114 Monroe, Detroit 7, Mich.* Magnetic hand tool for feeding into punch presses is said to be quickly adjustable for pieces of almost any size or shape.



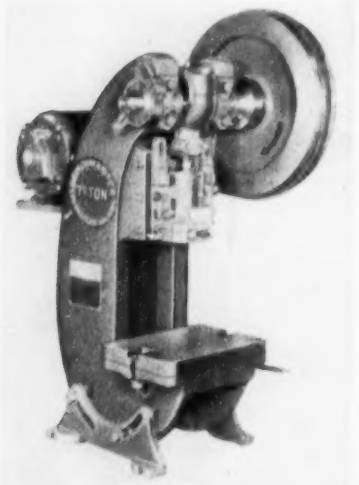
PUNCH PRESS—*Kenco Mfg Co, 5211 Telegraph Rd, Los Angeles 22, Calif.* This 4- or 5-ton punch press has a 12¾-in. throat. Speed can be regulated by a single adjustment for 90 to 280 strokes per min.



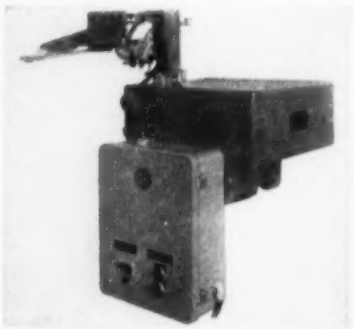
PUNCH PRESS — *Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* Where open tooling height, ram up, was formerly 6¾ in. an improved model 4-ton standard punch press possesses a full 8 in. Heavy-duty clutch dog is made of special shock-resisting steel. Heavy-duty cast-aluminum flywheel guards for the full line are now available.



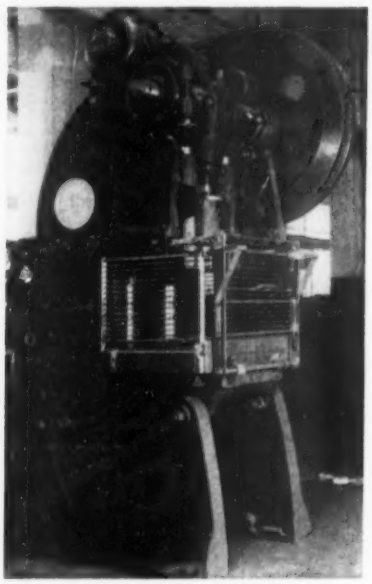
DIEOMETER—*Henry & Wright Div, Emhart Mfg Co, Hartford, Conn.* The Dieometer, an electronic instrument, accurately measures the loads occurring in power-press stamping operations. Designed for use on Henry & Wright Dieing Machines engaged in progressive stamping, it eliminates dependence on theory in determining whether press capacity is equal to imposed loads.



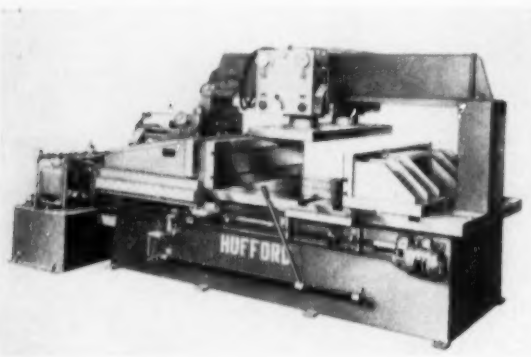
PUNCH PRESS — *Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* 7½-ton punch press has shut height increased to 9 in. (ram up, to bed). Standard stroke is 1¼ in., with special lengths up to 2½ in. Four hardened striking pins are mounted on the fly wheel.



MECHANICAL FEEDER — *V & O Press Co, Div Emhart Mfg Co, Hudson, NY.* A redesigned version of a mechanical punch-press feeder broadens the application of the unit in secondary die work and permits its use for parts transfer operations not connected with presses. The F-3 is equipped so that the pick-up can be timed to coincide with the completion of a production operation, or with the arrival of the part at a pre-determined location.



OPEN-GAP PRESSES — *Hercules Presses Ltd, Box 96, Postal Station K, Toronto, Ont, Canada.* Circular bar slides have been substituted for the ordinary V-slides. Specifications are: speed up to 250 strokes per min; single stroke or continuous operation; depth of throat, 3⅜ in.; and special strokes of 1¼ and 1½ in. furnished. Tonnages available are 35-, 45-, 60-, 75- and 95-ton. Selling agent is: Hercules Presses Ltd.

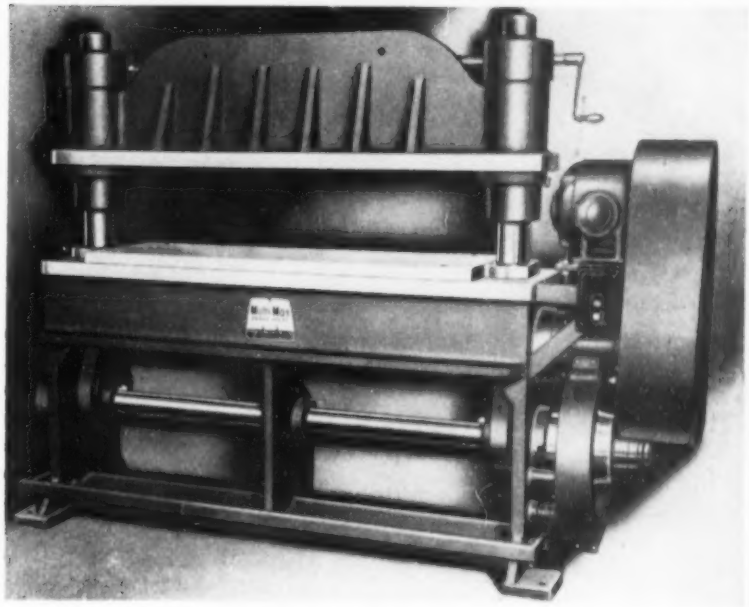


METAL - FORMING BULLDOZERS — *Hufford Machine Works, Inc, 1700 E Grand Ave, El Segundo, Calif.* The Hufford metal - forming bulldozer provides vertical hold-down cylinder replacing the previously used bolts, and positively securing pressure plates on the dies during forming. Although other work capacities and tonnages are available, the Model-88 bulldozer illustrated is rated at 150-ton.

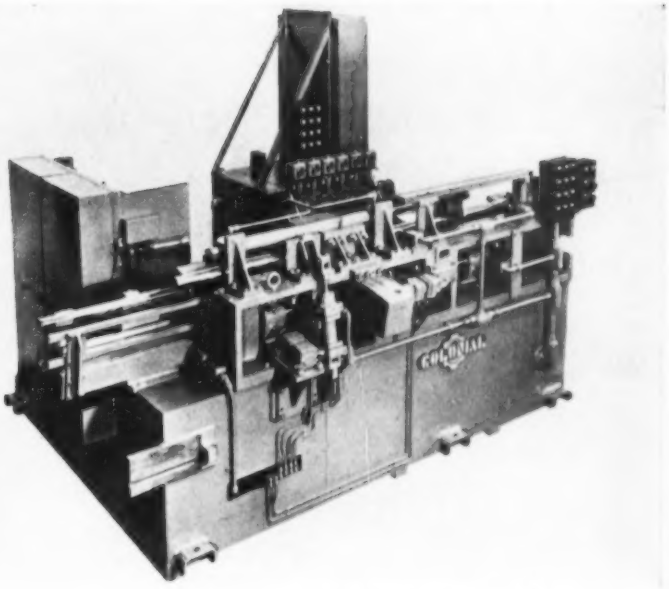
AUTOMATIC SHEET LIFTER—*Union Tool Corp, 31½ E Market St, Warsaw, Ind.* This unit eliminates the costly hand method of lifting and feeding sheets into a compound coater. The lifter is completely adjustable to pick up from 1 to 6 sheets per minute, and can handle sheets up to 48x48 in. They can be up to 200 lb in weight.

ARBOR PRESSES—*Benchmaster Mfg Co, Los Angeles 6, Calif.* Arbor presses in three sizes have capacity up to 2 tons and work clearance up to 9 in. Base and tapered column cast of semi-steel are rated at a safety factor of 5.

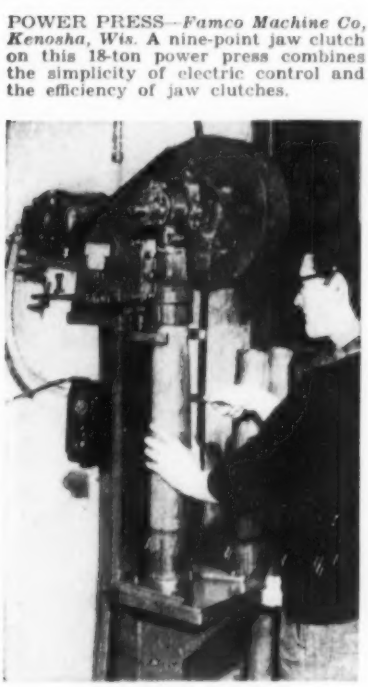
PUNCH PRESS — *Diamond Machine Tool Co, 3429 E Olympic Blvd, Los Angeles 23, Calif.* Model 3060 has the following features: 80 strokes per min; practically unlimited shut-die height to order; positive brake and counterbalance with equilabrator; all herringbone gears; four-point engaging clutch; electrically-operated clutch control. Simple conversion into power squaring shear.



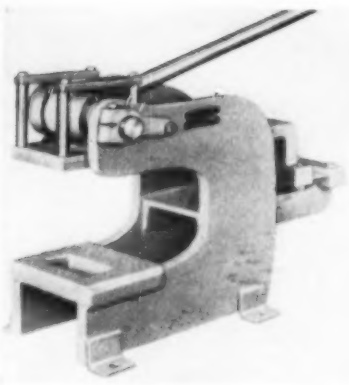
POWER PRESS—*Famco Machine Co, Kenosha, Wis.* A nine-point jaw clutch on this 18-ton power press combines the simplicity of electric control and the efficiency of jaw clutches.



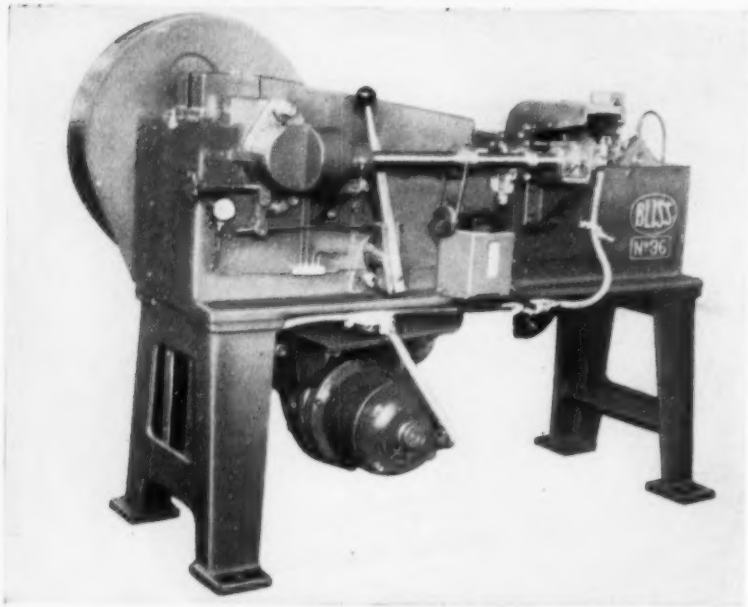
ASSEMBLY PRESS—*Colonial Broach Co, P O Box 37, Harper Station, Detroit 13, Mich.* This press is designed to operate in a fully-automatic transfer line for assembly of a maximum of 420 valve guides per hr in an automobile engine head. Automatic inspection of press-fit assemblies is provided.



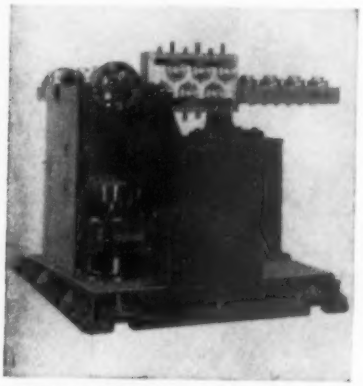
HALF-PRESS—*Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* In munitions manufacture there are many jobs in which low-tonnage punch presses would be adequate except for their small shut-height. This Benchmaster 4-ton half press enables any shut-height to be reached by bolting on your own base.



HORNING PRESS — *Leslie Welding Co, 2943 W Carroll Ave, Chicago, Ill.* Positive alignment with 5¼-in. die space, 12-ton capacity and narrow bed to permit horning or flange-notching operations feature this press.



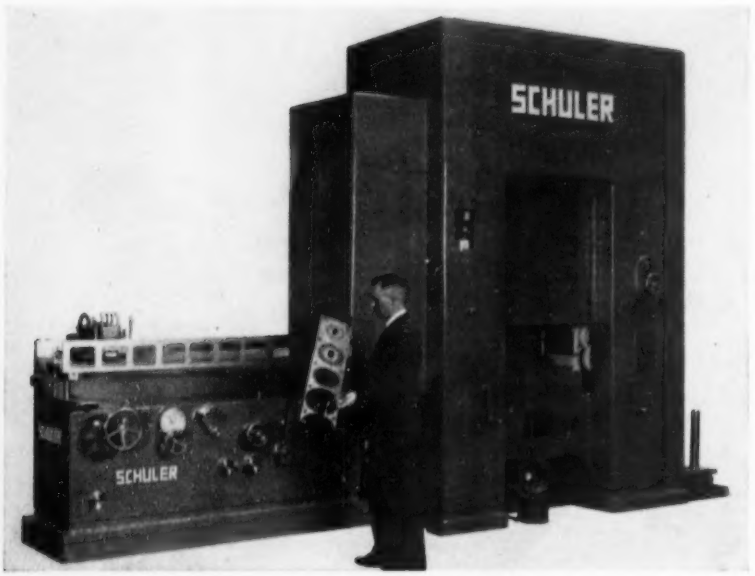
HORIZONTAL PRESS — *E W Bliss Co, Canton, Ohio.* Designed for piercing the flash hole on brass or steel 20-mm cartridge cases. The press operates at 60 strokes per minute. The hand-filled chute feed has three stations. The first is a detector to check the position of the case in the chute, the second a work station, and the third a detector to check the correct piercing.



FEED STARTER — *Mettler Machine Tool, Inc, New Haven, Conn.* The Shuster feed starter is for straightening and feeding the starting end of rod from coil. Feed rolls have two grooves to accommodate different diameters of wire up to ⅝ in., or can be supplied for square stock.

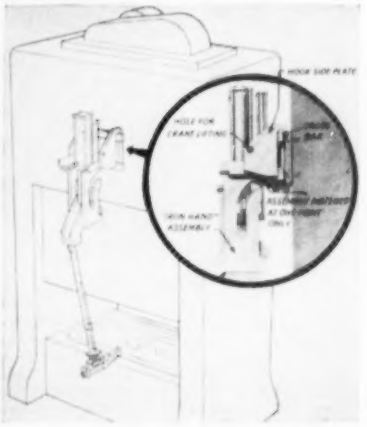
PUNCH-PRESS FEED—*Cooper Weymouth Inc, 277 Noble Ave, Bridgeport 8, Conn.* Slide feed operates off the press crankshaft, converting hand-fed presses to automatic operation. A stock support roller is quickly removable when not needed. The feed takes stock up to 4 in. in width and 5/32 in. thick with a maximum lead of 6 in.

DIAL RIVETER—*Chicago Rivet and Machine Co, 9600 W Jackson Blvd, Bellwood, Ill.* Model 4012 provides greater speed of tubular riveting through simplification of loading and control of operator speed. Combining a 40-in.-dia rotating dial fixture equipped with 12 stations, this unit feeds and clinches three tubular rivets simultaneously. Available are similar units of smaller size and greater or lesser number of stations as may be required for a particular job.



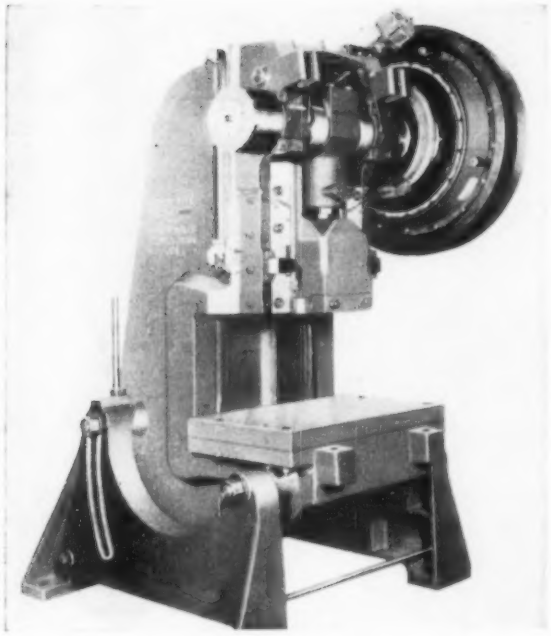
HIGH-SPEED PRESSES — *Transmares Corp, 15 William St, New York 5, N Y.* Series of presses, imported from Germany, operate at speeds of up to 400 strokes per min. A rigid, double-sided frame with heavy tie bars insures good slide guidance for delicate follow-up dies.

SHEET-STEEL SEPARATOR—*Clark-Hopkins Equipment Corp, 1124 Spring Garden St, Philadelphia 23, Pa.* This unit permits automatic separation of stacked steel sheets. The unit raises the top sheet about 2 in. above the balance of the stack. As each steel sheet is removed, the next one is raised and separated.

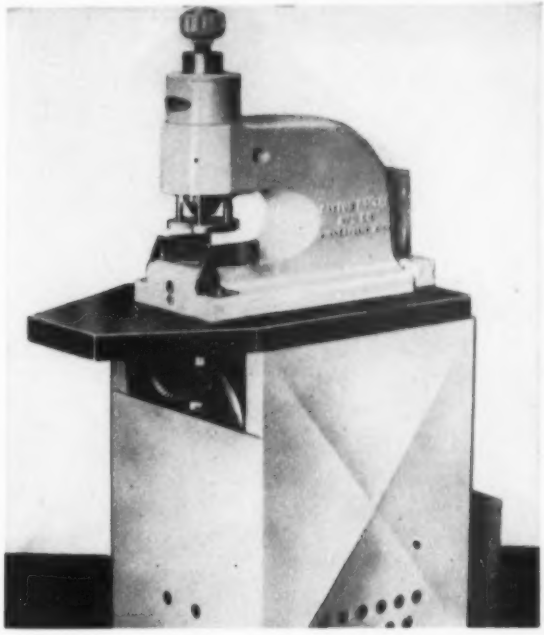


PRESS UNLOADERS—*Sahlin Engineering Co, Birmingham, Mich.* Mounting Device allows Iron Hand to be transferred from one press to another in a matter of minutes. The side plates hook onto cross bars of a bracket permanently attached to the top of the press. The mounting is fastened and locked at one point only. Holes in the side plates facilitate lifting and transfer of the unloader by crane.

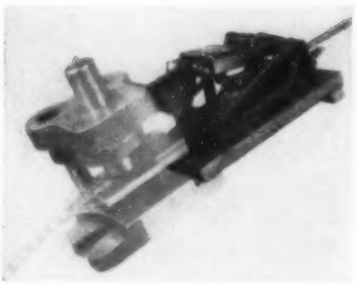
AUTOMATIC PRESS — *The Producto Machine Co, Bridgeport 1, Conn.* Feed length for 1½ in. or more stroke, 0 to 2 in., for presses having 1-in. stroke, 0 to 7 in. This feed for stamping presses is easy to mount and quickly set up for required feed length. Only two drive plates and a simple linkage, controlled by the movement of the press, are used to advance the stock.



POWER PRESS—*Sales Service Machine Tool Co, 2363 University Ave, St Paul 4, Minn.* This 60-ton press has a heavy-duty one-piece alloy frame with built-in tie rods of high-tensile steel. Known as the Model 60, it also has a drum clutch which is self-compensating for wear.



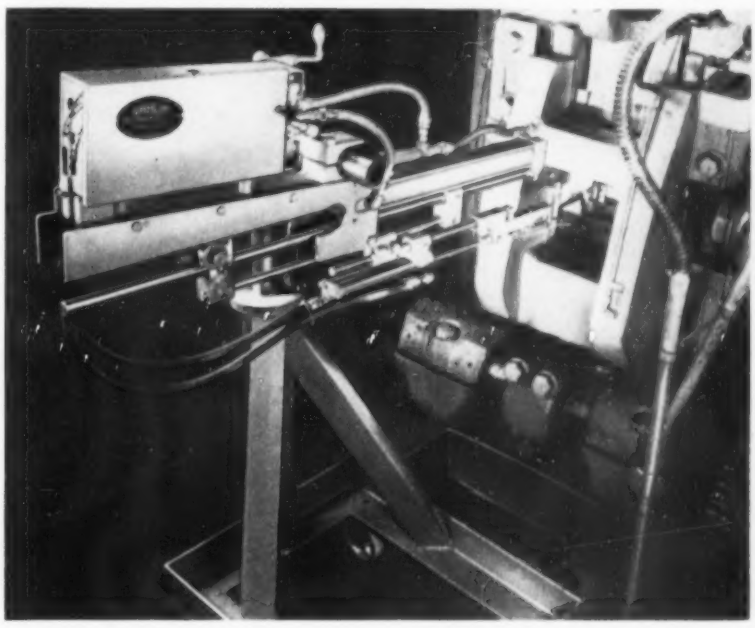
PIERCING PRESS—*Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Electric press pierces holes up to ½ in. in dia in materials up to 3/16 in. thick. The ram of the press is in the bed of the machine permitting the punches to be mounted above for easier location of the pierced holes. It will receive a standard Allied punch and die and is provided with a non-repeat mechanism.

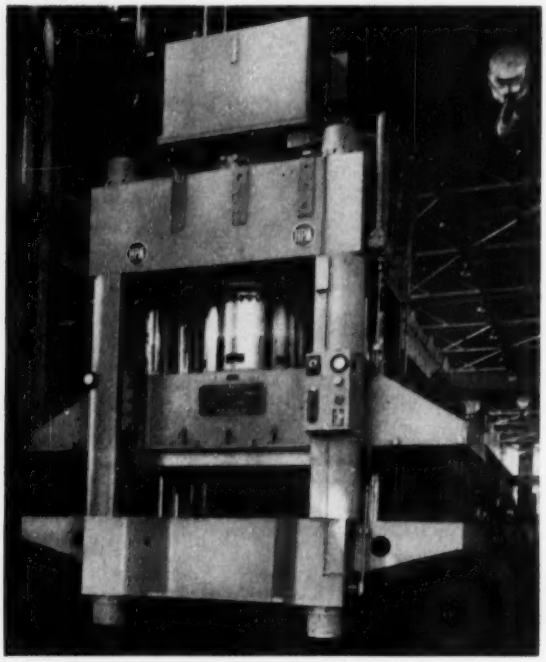


PRESS FEED—*Jaco Devices, Inc 90 High St, Hingham, Mass.* An automatic hitch-type press feed for mounting on the die set or bolster plate is cam-operated, but does not rely on the cam to obtain or maintain accuracy of pitch. The tool will feed any thickness of coiled stock up to 3/32 x 2-in. wide and transmit a maximum feed length of 2½ in.

PORTABLE UNLOADER—*Sahlin Engineering Co, 267 Ferndale St, Birmingham, Mich.* This automatic unloader can be wheeled up to small- and medium-size presses to remove small parts at high speed. Various jaw designs are available for a variety of special unloading conditions.

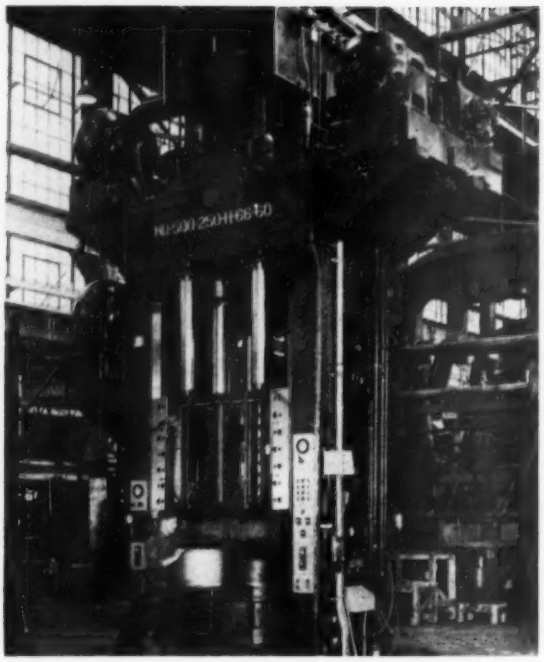
DIE CUSHIONS—*Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Hydropneumatic die cushion makes it possible to get practically any ring holding pressure in the limited press-bed opening with a minimum die-cushion height. This is accomplished by a combination of both pneumatic and hydraulic principles.





QUENCHING PRESS—*The Hydraulic Press Mfg Co, Mt Gilead, Ohio.* Handle 5 large armor plates from ½ to 2-in. thick. Over-all bed size is 72x235 in. Clearance between rod shields is 98x72 in. Hot armor plate from the hardening furnace is placed in the press and held under pressure between dies while being sprayed with cold water.

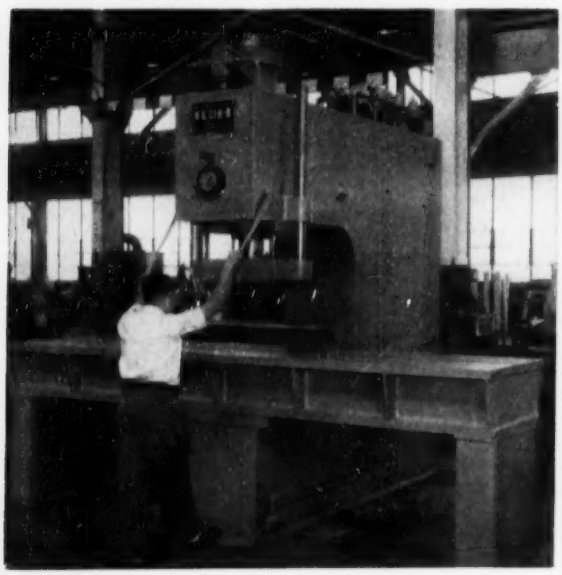
HYDRAULIC PRESS—*Elmes Engineering Div, American Steel Foundries, Cincinnati 29, Ohio.* Has a 75-ton capacity and is specially equipped for double-duty performance. Press uses a long table for straightening gun barrels. Table is removable, making press usable as a general-purpose straightening press, and in addition an opening in the bed provides for forcing operations. ↓

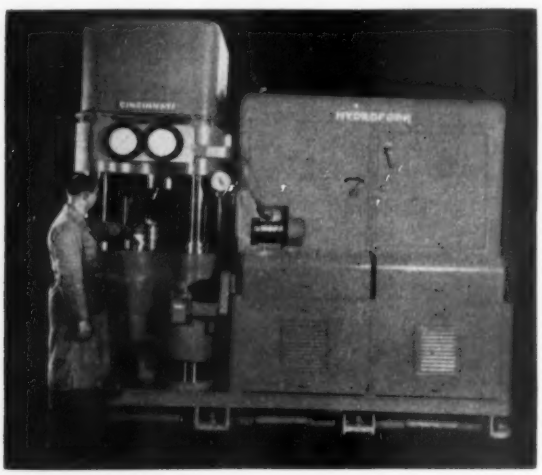


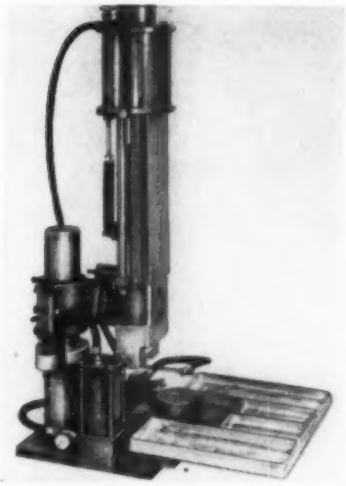
AIR-POWERED BENCH RIVETER —*Barrett Equipment Co, 21st & Cass, St Louis 6, Mo.* Can be used for riveting, de-riveting, punching, forming, and stamping merely by changing tools. Although designed for bench installation, it can be installed on either a base or a stand. Single air-line connection is all that is required. A standard foot control is furnished, but either a hand or automatic control may be used.

DOUBLE-ACTION HYDRAULIC PRESS—*E W Bliss Co, Canton, Ohio.* Speeds production and controls quality of deep-drawn washer tubs. Fast draw is done with 250 tons using the main cylinder only. Blankholder pressure is adjustable at all four corners. Converted to single-action press, a full 750-ton capacity is available.

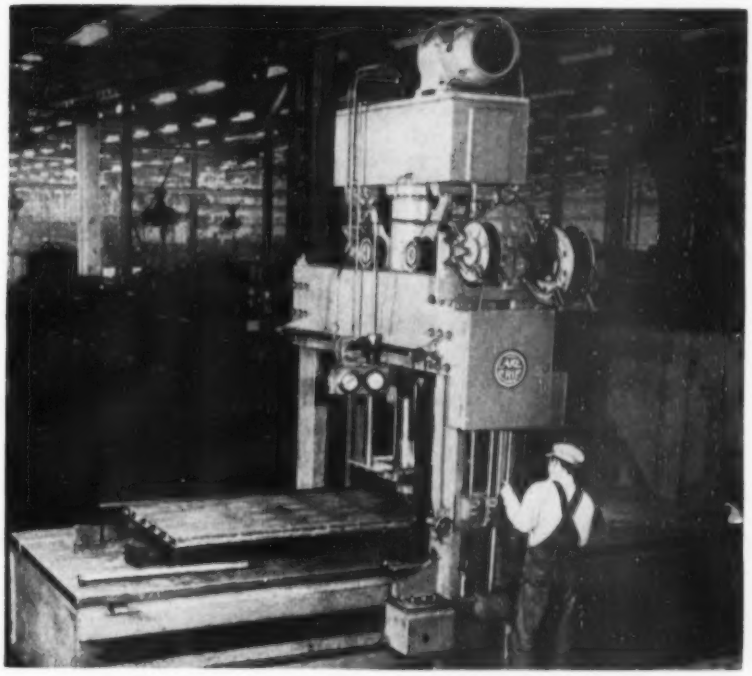
DEEP DRAWING — *The Cincinnati Milling Machine Co, Cincinnati 9, Ohio.* Hydroform machines consist basically of the heavy base in which the bolster plate and punch are mounted, a dome which contains the flexible die member, and four strain rods for containing these units. Maximum blank dia is 26 in. and maximum draw depth is 12 in. ↓



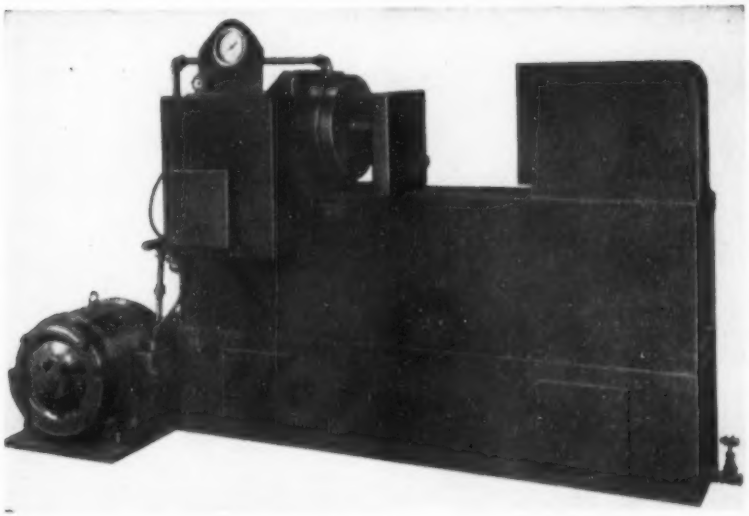




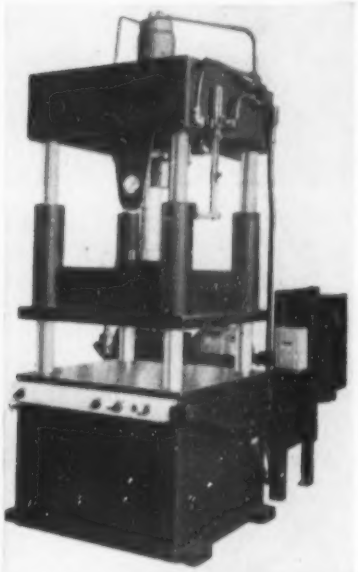
STAKING PRESS—*Winter Products, Inc, Box 3112, Barnum Station, Bridgeport, Conn.* Improved Winter staking press is capable of 100 or more strokes per minute. It can deliver an accurately controlled impact from 0 to 12,000 lb, or a squeeze up to 12-times air-line pressure. The stroke may be set for 1 or 2 in.



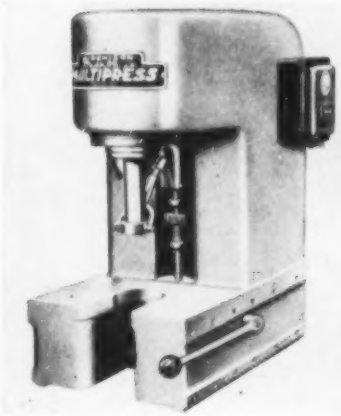
STRAIGHTENING PRESS — *Lake Erie Engineering Corp, Buffalo, N Y.* Presses, from 200 to 2000 tons, feature optional two-speed ram travel in both longitudinal and transverse directions. They are available with either one or two traveling heads on the same bed frame.



HORIZONTAL PRESS—*M & N Machine Tool Works, 287-293 Allwood Rd, Clifton, N J.* This horizontal hydraulic press is pushbutton operated, with automatic reversal at pressure setting. It is impossible for operators to override the pressure which eliminates the resultant scrap loss in materials.

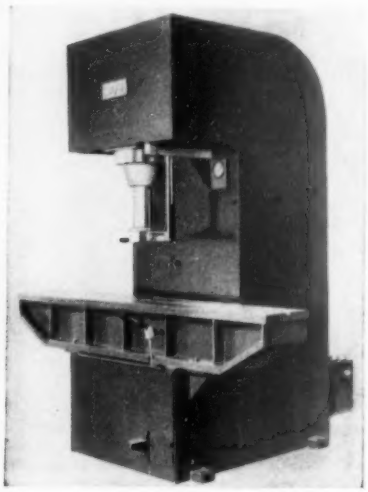


GUIDED-PLATEN PRESS—*Dake Engine Co, Grand Haven, Mich.* Dake plastic presses are electrically powered and hydraulically operated. They are built of welded steel throughout, and thus have the rigidity necessary for the accurate molding of plastics. Standard press capacities range from 25 to 300 tons.

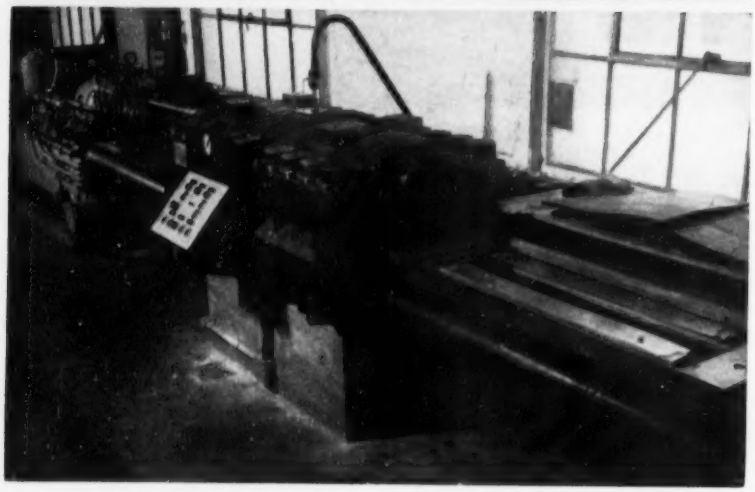


SERVO-CONTROL—*The Denison Engineering Co, Dublin Rd, Columbus 16, Ohio.* Close control over ram speed is now possible with "Touch Control", a servo-type valving in the oil hydraulic press circuit of the Multipress. Whether the lever is pressed rapidly or slowly, the ram follows up its maximum speed. Minimum ram stroke is about 1/16 in., maximum is 6 to 15 in., depending on the model.

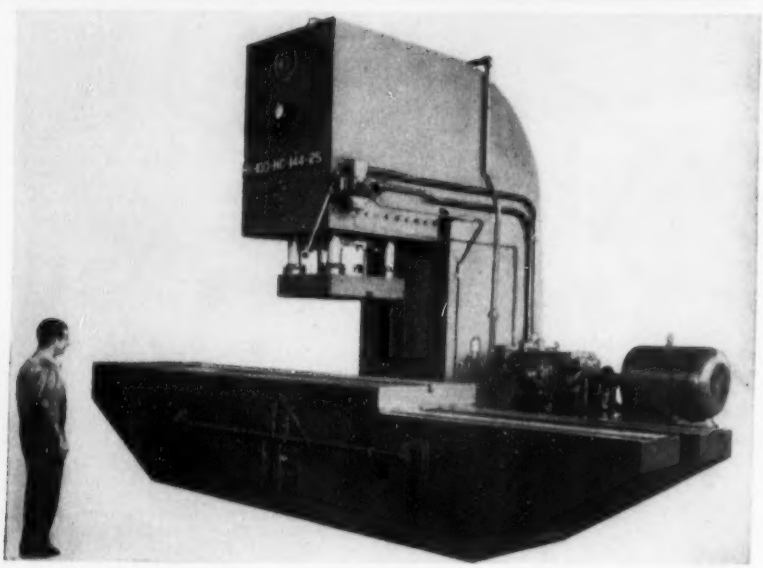
←PIERCING MACHINE — *Danly Machine Specialties, Inc, 2100 S Larimie Ave, Cicero, Ill.* Pierces impeller-blade holes in shroud rings for jet engines. The ¼-in.-thick rings are first rough machined, then pierced, leaving about 0.005 to 0.006 in. of stock around periphery. Can be used for many other radial piercing operations.



AIR PRESSES — ***Dake Engine Co, Grand Haven, Mich.*** Line of hydraulic air presses for forcing and straightening operations in eleven standard forcing models, and eleven standard straightening models—with capacities ranging from 15 to 300 tons. They are electric powered.



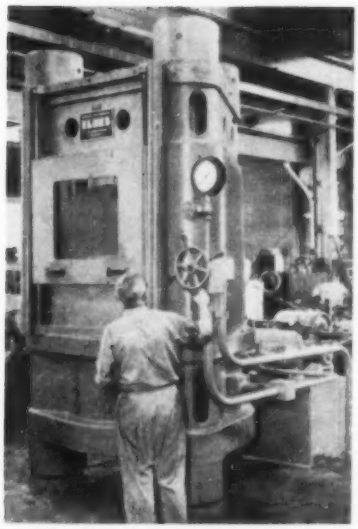
←FORMING PRESS — *Verson Allsteel Press Co, Chicago, Ill.* The Wheelon press does the same work (shallow forming of sheet metal) as a press using the Guerin process, but with 1/10 the size and only between 20 and 30% of the cost for the same capacity.



AIR-RIVETER — *Lemert Engineering Co, Plymouth, Ind.* A rotating hammer that can be regulated for force, speed, and duration of blows is a feature of the improved Airflex pneumatic riveter. Blow force and hammer speed can be adjusted independently of each other; from 5 to 80 psi, and from 6000 to 16,000 cycles per min.

RIVETER — *Manco Mfg Co, Bradley, Ill.* Model R-20-185 portable Riveteer unit operates through a manually controlled hydraulic valve. Operator depresses hand lever on riveting head to produce action; when full pressure (adjustable to 30 tons) is reached, valve automatically provides ram retraction. Model has capacity of 4½ by ½-in. rivets.

←STRAIGHTENING PRESS — *E W Bliss Co, Canton, Ohio.* Quick positioning is obtained by hydraulic systems which move the press bed from side to side and the plunger assembly from front to back at the touch of a lever. It allows a number of blows to be struck at different places without changing the table setting. Press capacity is 100 ton.



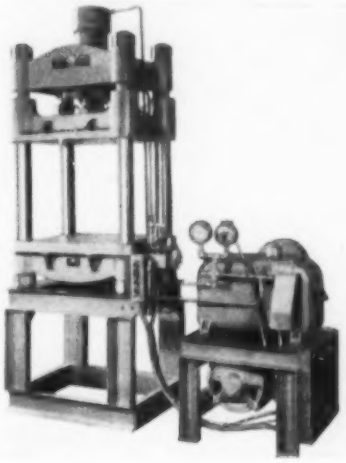
HYDRAULIC HOBBING PRESS — *Elmes Engineering Div, American Steel Foundries, 1150 Tennessee Ave, Cincinnati 29, Ohio.* Of 25-ton capacity will be used by an aircraft-engine manufacturer for die-quenching. This operation involves a quick cooling of hot forgings while retained in a die under extremely high pressures, thereby maintaining maximum accuracy while developing high physical properties. Stroke is 15 in. and speeds of operation are: Advance, 10 ipm; press ½ ipm; return, 20 ipm. Maximum opening between platen and head is 32 in.

OPEN-GAP PRESSES — *Transmares Corp, 15 William St, New York 5, N Y.* The hydraulic system on this Eitel (German-made) open-gap press has been developed to provide a totally enclosed and fully protected assembly. Stroke can be adjusted by limit stops to accommodate the work. The presses are available with up to 400 tons capacity.

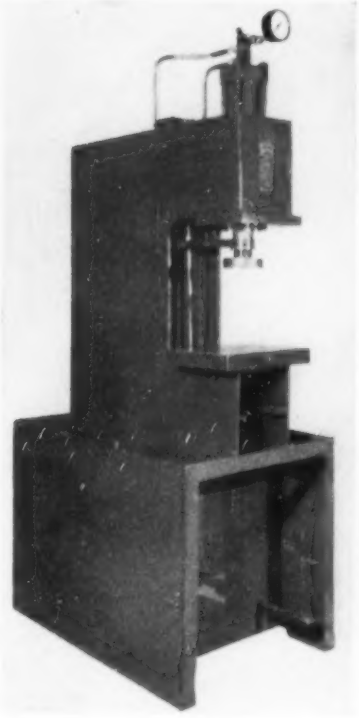
→

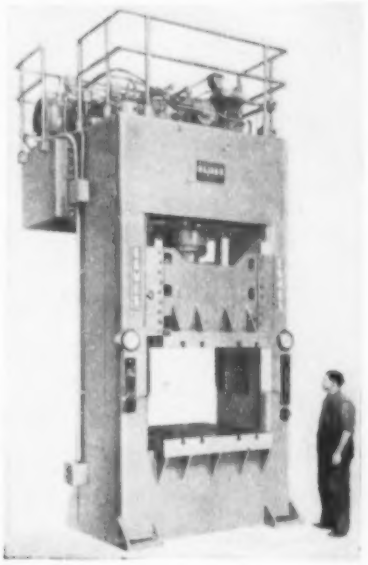
HYDRAULIC GAP PRESS — *Munton Mfg Co, 9400 Belmont Ave, Franklin Park, Ill.* Munton Super Model hydraulic gap press is a belt-drive unit with a six-cylinder wobble-plate hydraulic pump. It has a 5-hp, 220-440 v, 3-phase, 60-cycle motor and starter.

SCRAP-BALING PRESSES — *Kurt Orban Co, Inc, 205 E 42nd St, New York 17, N Y.* Two forms of scrap-baling presses are being imported from Germany, the shearing-ram and pressing-lid types, in a wide range of models and sizes. Smallest model produces 265-lb bales at rates up to 58 per hr, the largest 800-lb bales at up to 52 per hr.

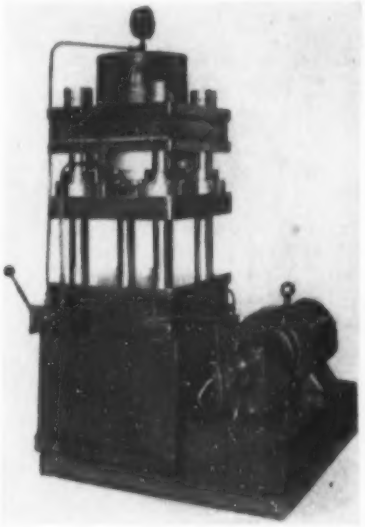


PLATEN PRESSES — *Rodgers Hydraulic, Inc, Minneapolis 16, Minn.* Line of platen presses are available with square or rectangular multiple platens, 90°-angle transfer frame, and top transfer. Capacities range from 10 to 500 tons. A two-speed hydraulic hand pump develops a maximum pressure of 10,000 psi, with automatic shift.



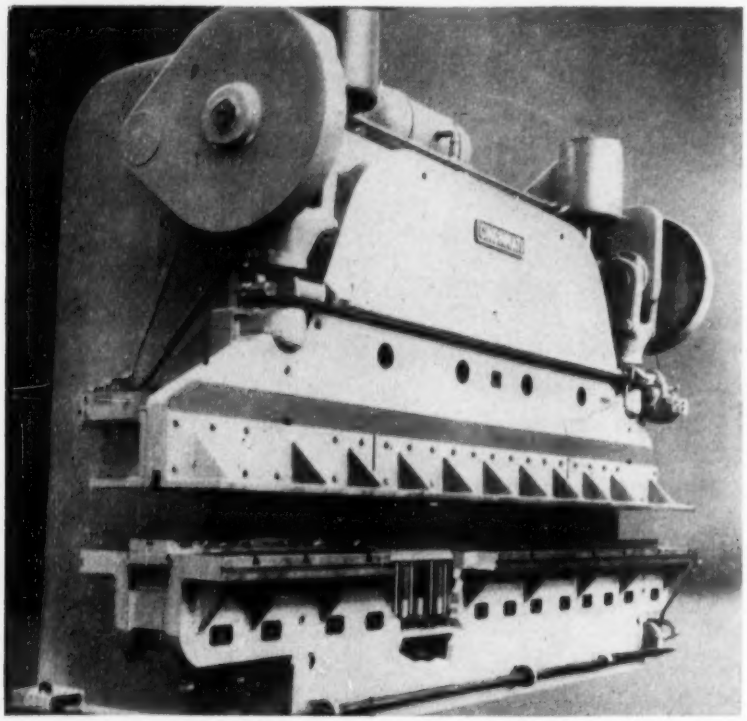


HYDRAULIC PRESS — *American Steel Foundries, Elmes Engineering Div, 1150 Tennessee Ave, Cincinnati 29, Ohio.* The ram exerts a low tonnage by activating one foot switch, and a high tonnage by activating the other. Plow beams are bent to a specific angle at low tonnage and then turned for flattening at the high tonnage.



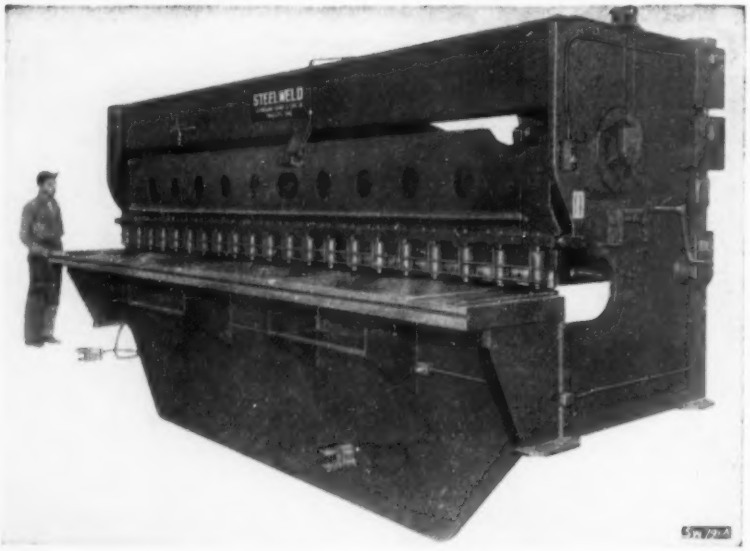
HYDRAULIC PRESS—*Oilpower Engineering Co, 1067 Davis Terrace, Schenectady 3, N Y.* The hobbing presses have four columns and are of all-welded steel constructions. They have various bed areas and ram strokes, and range from 100 to 1000 tons capacity.

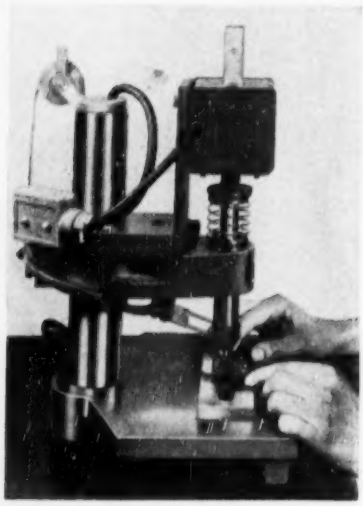
STRAIGHTENING PRESS — *Hufford Machine Works, Inc, El Segundo, Calif.* An automatic stroke limiter on hydraulic straightening press protects against overbending. An automatic counter indicates ram extension to within 0.010 in. from the starting position and a dial gage shows applied force from 0 to 150 tons.



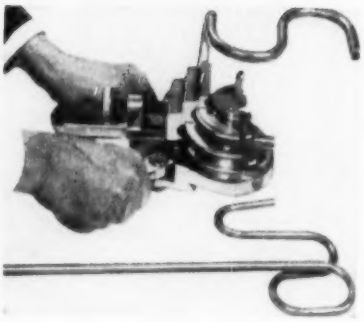
PRESS BRAKE — *Cincinnati Shaper Co, Hopple, Garrard & Elam Sts, Cincinnati 25, Ohio.* This press brake has a double plate bed, 30 in. wide, and 15 ft 8 in. in over-all length. There are 14 six-inch air cylinders mounted between plates for operating draw rings, knock-out bars, and similar units. Machine weighs 72,000 lb., has a speed of 23 spm, and removable ram angles for press or brake operation.

BENDER — *Kilham Engineering, Inc, Plainville, Mass.* Bendit metal-forming machine has capacity for 15-in. widths of 18-gage steel, and 1/8-in. strip ⅝ in. wide. Bend radii can be from 1.32 to ⅝ in., or larger with special bars attached.





STAKING MACHINE—*Black & Webster, Inc, Dept N71, 445 Watertown St, Newton, 58, Mass.* All-electric staking machine, Electrostake, is powered by a solenoid rather than the spring-loaded trip hammer usually used. Both the hold-down pressure and staking blow are adjustable. The largest model can deliver a blow of 3000 lb.

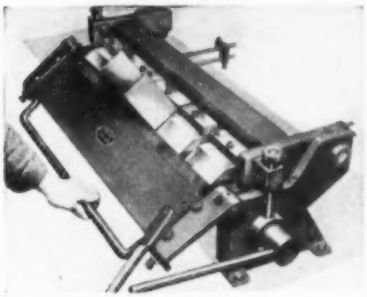


SHEAR—*Cleveland Crane & Engineering Co, Wickliffe, Ohio.* Series 3C20 Steelweld shear, with a capacity of 20 ft in 3/16-in. steel plate, employs the pivoted-blade principle. Blade travels in a circular path without the guides and slides common in guillotine-type shears.

←

TUBE BENDS—*Tal Bender, Inc, Milwaukee 2, Wis.* Tool makes offsets and bends up to 180 deg. in ⅜-, ½-, and ⅝-in. OD, K and L Copper Tubing, brass, Bundyweld, steel, and other light-gage tubing.

SQUARING SHEAR — *Niagara Machine & Tool Works, 637-697 Northland Ave, Buffalo 11, N Y.* The simplified construction of these shears eliminates such parts as flywheels, gears, clutches, motors, and electrical controls—thus reducing initial cost and maintenance. Air from any system with pressure of 70 or 80 psi is all that is necessary.



BENDING BRAKE—*Dries & Krump Mfg Co, 7400 S Loomis Blvd, Chicago 36, Ill.* Size BB-2, this bench model, hand-operated, universal box and pan brake has been added to the Chicago line. Capacity for sheet metal up to 18 gage, 24 in. long.

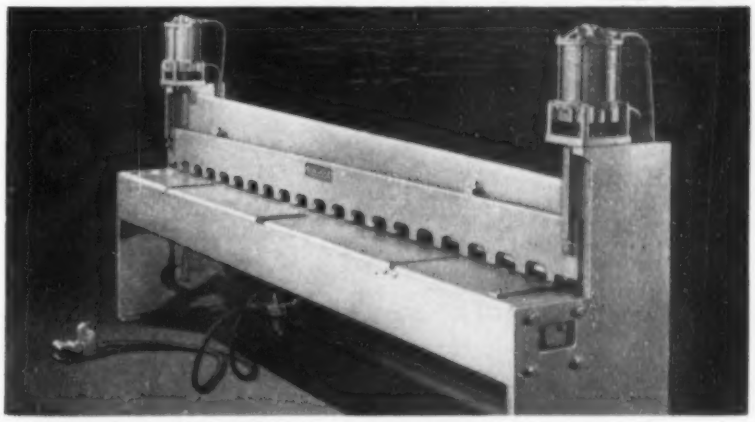
SQUARING SHEAR—*The Cincinnati Shaper Co, Hopple, Garrard & Elam Sts, Cincinnati 25, Ohio.* Is able to cut 24 ft of ¼-in. mild-steel plate. The hydraulic holddowns exert more than 22 tons pressure. Cutting cycle is 20 strokes per minute. 24-in throat, 4-in. back gage range.

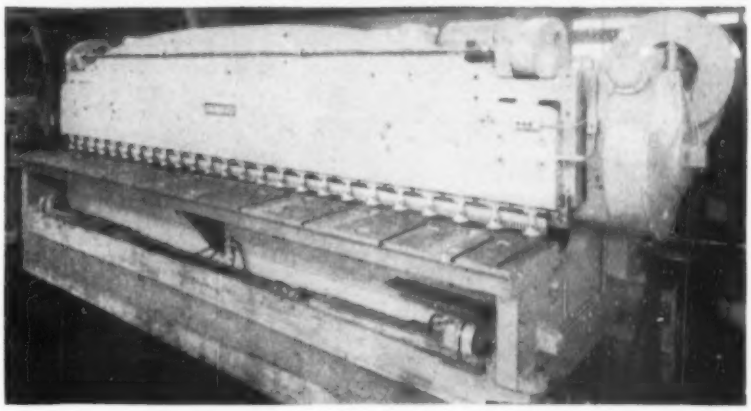
SHEAR ATTACHMENT—*Fried Steel Equipment Mfg Corp, 528 E 119th St, New York 35, N Y.* Known as the Scrap Eliminator; permits a single operator to discard trim cuts, automatically, without leaving his position. Before taking trim cuts, the operator pushes a hand lever which deflects the attachment's air-operated tilt table, causing rejects to fall into a scrap box below.

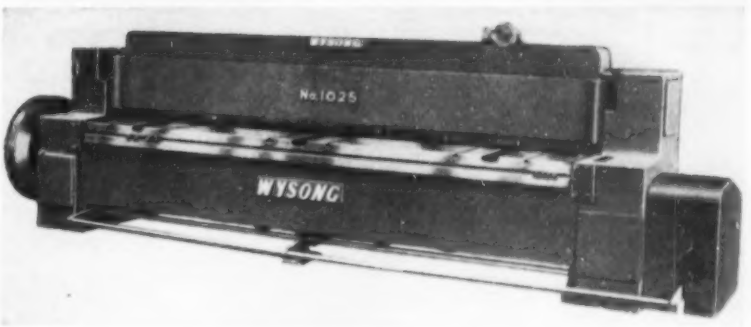
SQUARING SHEARS — *Wysong and Miles Co, Greensboro, N C.* Features of this ¼-in. power squaring shear line include: ball-bearing back gage adjustable to 0.0078 in., front-operated handwheel, holddown action by roller and cam action, individual compression springs in each holddown foot to compensate for varying thickness.

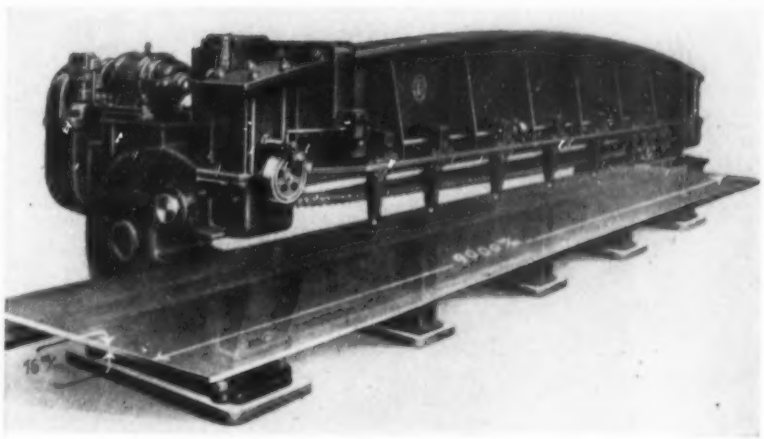
ROTARY STRAIGHTENER — *Mackintosh-Hemphill Co, 901 Bingham St, Pittsburgh 3, Pa.* Model AYZ rotary straightener for removing waves, bends and kinks from cut lengths of 1/16-in. rod or tube up to ¼-in.-OD thin-wall tubing. Full accessibility to rolls is secured by three-post construction. It is completely equipped with anti-friction bearings and is 22-in. wide, 19-in. deep and 8-in. high.

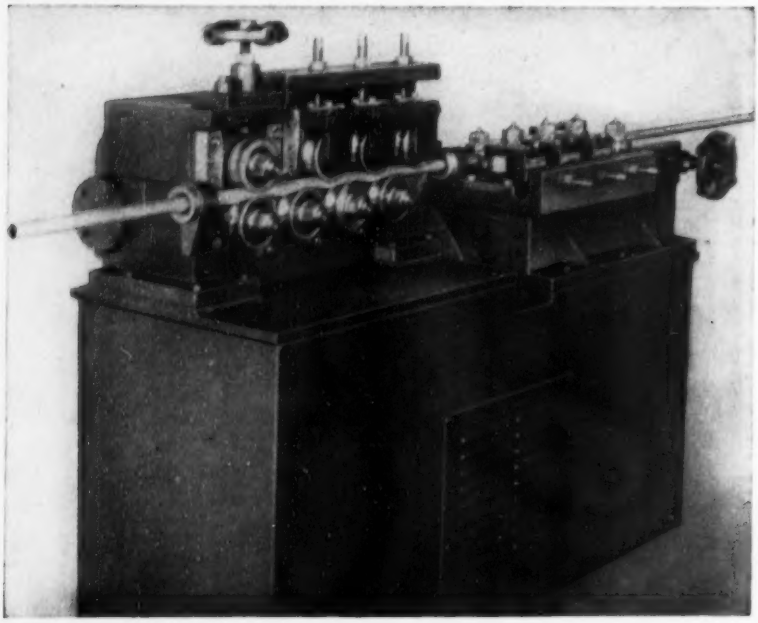
ROTARY SHEARS — *Transmares Corp, 15 William St, New York 5, N Y.* The S&N (Germany) rotary shears use one or two circular blades traversed along a fixed, straight lower blade. This design offers the following advantages: The range of shears have the following capacities in thicknesses, ⅛, 3/16, 5/16, ½, ⅝, 13/16, 1, 1 3/16, and 1¾ in.





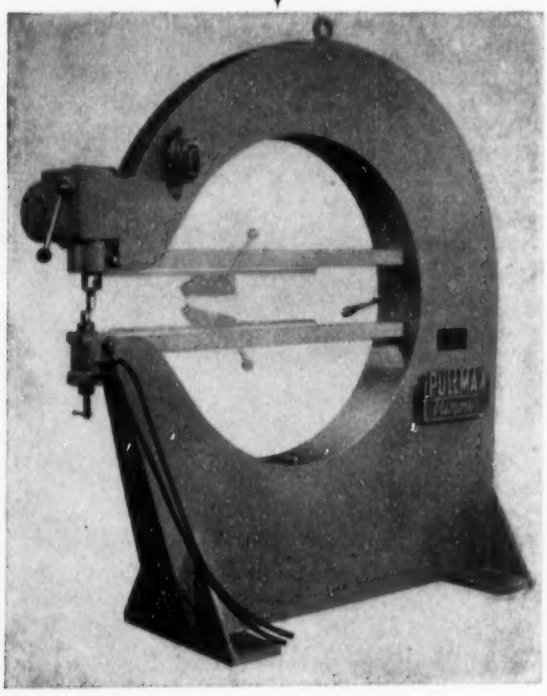






STRAIGHTENER — *Mettler Machine Tool Inc, New Haven, Conn.* Thin-wall tubing of 1-in. OD and solid bar stock to ½-in. diameter are straightened on the Shuster two-way-geared roll machine. The tube does not rotate during passage, thus eliminating stock damage such as spiraled burrs.

SHEET-STEEL TRIMMERS—*American Pullmax Co, 2455 N Sheffield Ave, Chicago 14, Ill.* Designed for cutting the excess metal from deep drawn and bulky stampings. Works mild steel up to 5/32 in. at a speed from 4 to 16 fpm. It has a throat depth clearance of 48 in., and is powered with a 1-hp. motor.



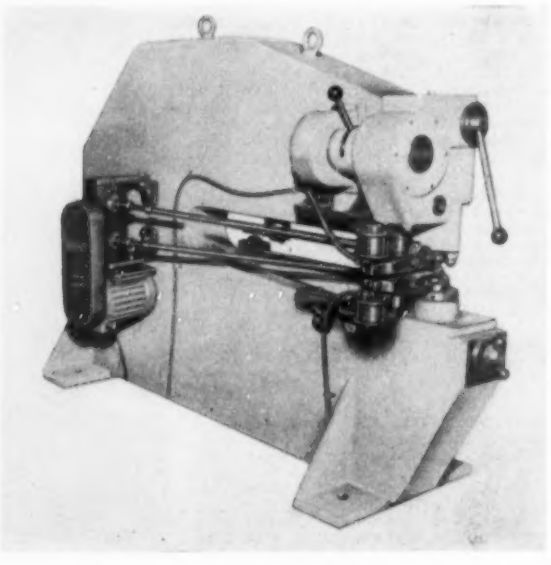
TUBE BENDER—*Imperial Brass Mfg Co, 1200 W Harrison St, Chicago 7, Ill.* For copper, aluminum, brass, and other soft, thin-wall tubing, this unit has a dual-size shoe and mandrel which permits bending two different sizes of tubing without changing any parts.

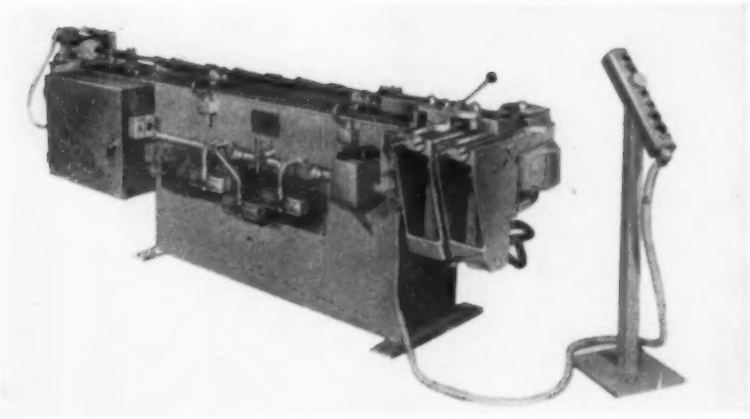
DRAWN-SHELL TRIMMER—*Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Model ST-2 Trimmer is capable of trimming square, rectangular, round or irregular-shaped shells. It also beads, knurls and forms with all operations completed in one work cycle. Work spindle speed operates from 5 to 40 rpm. Max stock thickness it will take is 0.093 CRS or to 0.062 in. in stainless.

METAL-FORMING MACHINE — *Kilham Engineering Inc, Plainville, Mass.* This improved Bendit metal-forming machine is easy to set up, simple to operate. Metal sheets, rods, strips, and tubing are bent and shaped into complex as well as simple forms. The machine will bend 15 in. of 18-gage mild steel or equivalent.

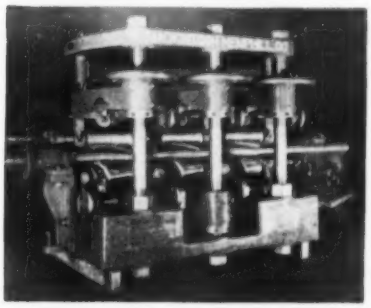
BENDER—*Kilham Engineering Inc. Plainville, Mass.* Bendit metal-forming machine has capacity for 15-in. widths of 18-gage steel, and ⅛-in. strip ⅝ in. wide. Bend radii can be from 1.32 to ⅝ in., or larger with special bars attached.

SHEET-WORKING MACHINES — *American Pullmax Co, Inc, 2455 N Sheffield Ave, Chicago 14, Ill.* Power feed has been designed for use on the Pullmax Major, Model P-5 and Model D-3 to aid in cutting and working steel plate up to 11/32-in. thick.

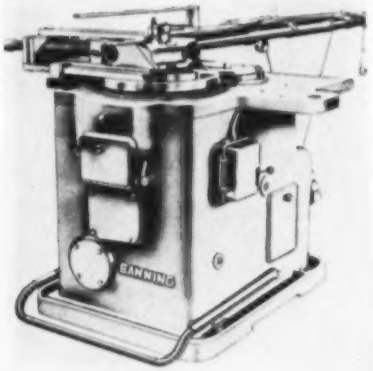




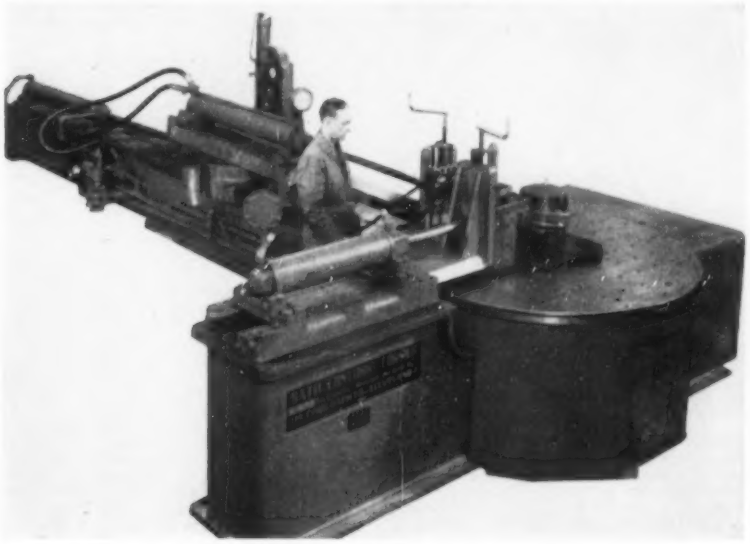
TUBE BENDER—*Pines Engineering Co, Inc, 601 Walnut St, Aurora, Ill.* Bender with ¾-in.-pipe capacity has two important improvements—it occupies 30% less floor space and has a new operating circuit that permits individual control of all functions at any time during the cycle.

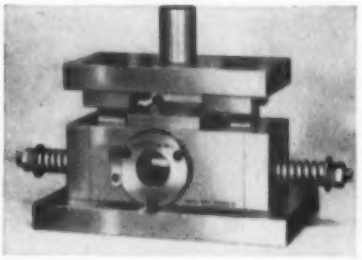


GUIDELESS ROTARY STRAIGHTENER—*Mackintosh-Hemphill Co, 901 Bingham St, Pittsburgh 3, Pa.* Straightens steel tubing in commercial pipe sizes from ½ up to 1¾ in. OD, and will also straighten brass, copper, aluminum, and other non-ferrous thin-wall tubing in sizes up to 3 in. OD. Production speeds of from 40 to 400 fpm are obtainable.

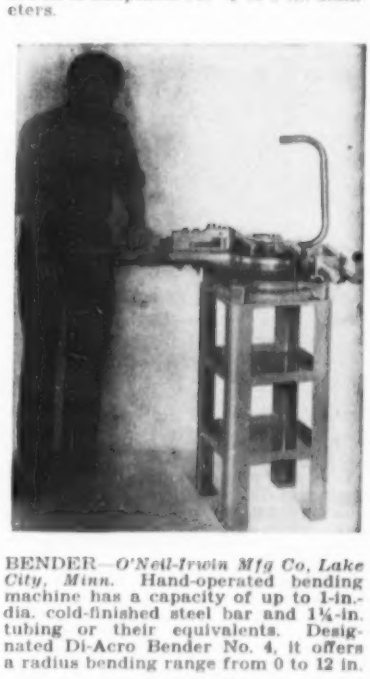


TUBE BENDERS—*Mercready, Handy & Van Denburgh, 16-18 Van Wagenen St, Newark, NJ.* Banning Tube Benders (Germany) provide advanced setting of two different degrees of tube bends without removing the tube from the mandrel rod. Machines in the series have capacity for ferrous tubing with maximum diameter of 1, 1½, 2¾, 4½ and 5½ in. Only hand operations are feeding the tube and withdrawal of the completed bend.





PIPE AND TUBE NOTCHER—*Vogel Tool and Die Corp, 1807 North 32nd Ave, Melrose Park, Ill.* Time required for notching pipe and tube ends has been reduced to less than 3 sec. by this tool for use with a punch press. As the press ram comes down, the punch is driven laterally to notch one side, then in the opposite direction to notch the other side. This twin-notch arc-fit is adaptable for ½ to 2 in. diameters.

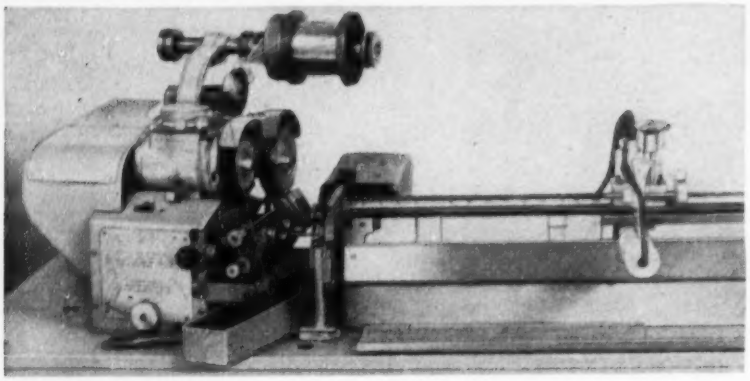


BENDER—*O'Neil-Irwin Mfg Co, Lake City, Minn.* Hand-operated bending machine has a capacity of up to 1-in.-dia. cold-finished steel bar and 1¼-in. tubing or their equivalents. Designated Di-Acro Bender No. 4, it offers a radius bending range from 0 to 12 in.

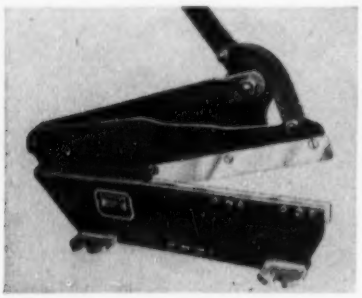
SHEET WORKER—*American Pullmax Co, Inc, 2455 N Sheffield Ave, Chicago 14, Ill.* Model P-3 sheet and plate working machine has all operating parts moving in an oil bath. It will cut mild steel up to 5/32 in. thick and has a throat depth of 34 in. It can do straight, circle, and irregular cutting, slot cutting, beading, folding, etc.

TANGENT BENDER—*The Cyril Bath Co, 6984 Machinery Ave, Cleveland 3, Ohio.* Single-wing tangent bender will shape flanged sheets around fixed radiused corners without wrinkling. Ram latches with bed the last inch of travel and exerts up to 17-ton vertical pressure. It is available in three types, having die space of 48, 36, or 24 in.

ROTARY DRAW FORMER — *The Cyril Bath Co, 6984 Machinery Ave, Cleveland 3, Ohio.* It consists of a power-driven rotary steel table and a horizontal bed on which is mounted a hydraulically movable carriage. The rotary draw formers are produced in six sizes: 12½, 25, 35, 50, 75 and 100 ton.



WIRE COILER — *Driver-Harris Co, Harrison, N J.* This machine enables wire of different sizes to be coiled with uniformity and without the wire being scored or misshapen. The photoelectric-cell cutting-knife control assures each coil being cut exactly to the length required. Standard model coils Nos 20 to 36 B&S gage wire.



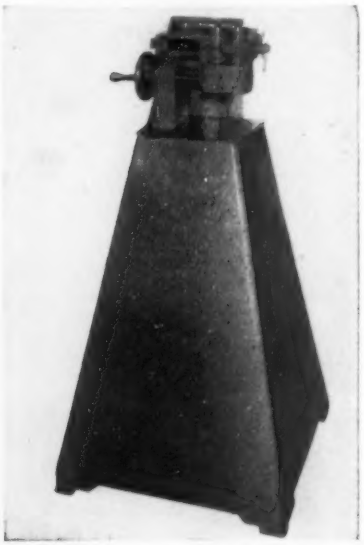
SLITTING SHEAR — *Julius Blum & Co, Inc, 532-540 W 22nd St, New York 11, N Y.* Model No. 40 has a blade length of 14 in. which makes it suitable for cutting wide strips of light-gage metal in one stroke of the lever. Offset frame permits slitting sheets of any length or width. Capacity is ⅛-in. mild-steel sheet or plate; net weight is 140 lb.

TUBE BENDER—*Imperial Brass Mfg Co, 1200 W Harrison St, Chicago 7, Ill.* Universal tube bender No. 270-F will bend any kind of tubing, including hard drawn copper and hard temper steel. It can be positioned on the tube at any point where a bend is desired, even when one end of tube is connected. Produces right or left-hand return, offset, and right-angle bends.

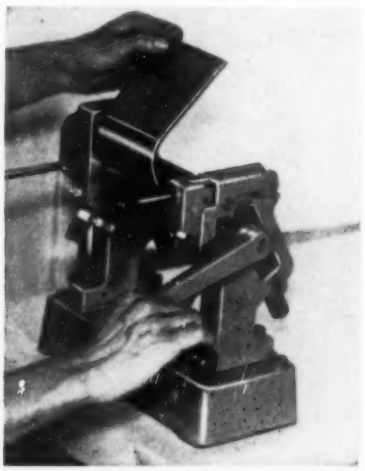
SHEET-METAL FABRICATOR — *Wales-Strippit Corp, North Tonawanda, N Y.* The combination worktables and tool racks are placed on each side of the fabricator and are the same height as the bed table. Fabricator punches and notches up to ¼-in.-thick mild steel from blueprints or operation sheets with no templets required.

SHEARING TOOL — *McCoy Product Co, Inc, Salt Lake City 1, Utah.* Shearing tool that cuts 14-gage stainless and mild steel up to ⅛ in. thickness operates on a simple leverage principle. It is portable, weighs 9 lb.

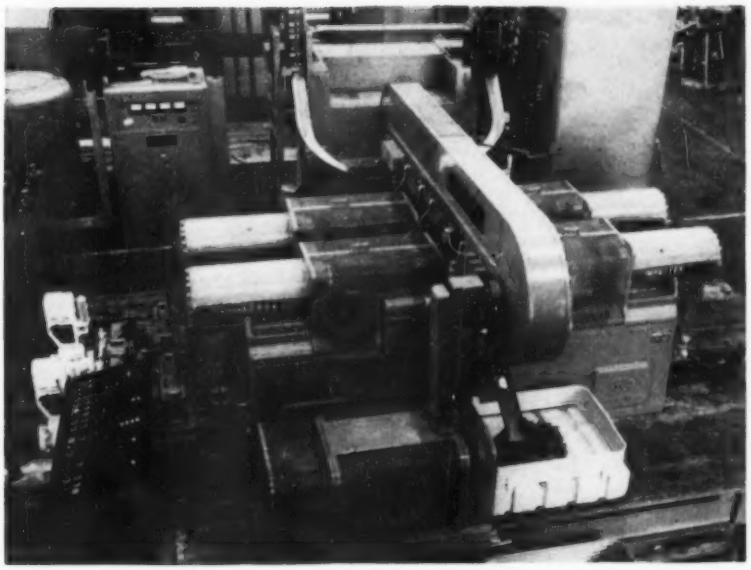
SPRING COILER — *The Monroe Co, Inc, 10703 Quebec Ave, Cleveland 6, Ohio.* Hand-operated spring-coiling machine for making compression, extension, and torsion springs includes a structural-steel base plate. Compression springs are coiled with both ends squared automatically.



SPRING COILER—*Perkins Machine & Gear Co, Springfield, Mass.* A ¼-hp motor drives spring coiler, which has the same head as the hand model except for new bearings and gears. Stock from 0.005 to 0.125 in. in dia can be formed into torsion, compression, extension, and tapered springs without arbor changes.



SLIP ROLL — *O'Neil-Irwin Mfg Co, Lake City, Minn.* Di-Acro roller, a cam-actuated idler roll enables complete circles of 1-inch dia or larger to be formed in two passes. Maximum capacity of the roller is ¼-in.-round steel bar and ¾-in. tubing, or their equivalents. The No. 1 roller forms material up to 6 in. wide, and the No. 2 forms material up to 12 in. wide.

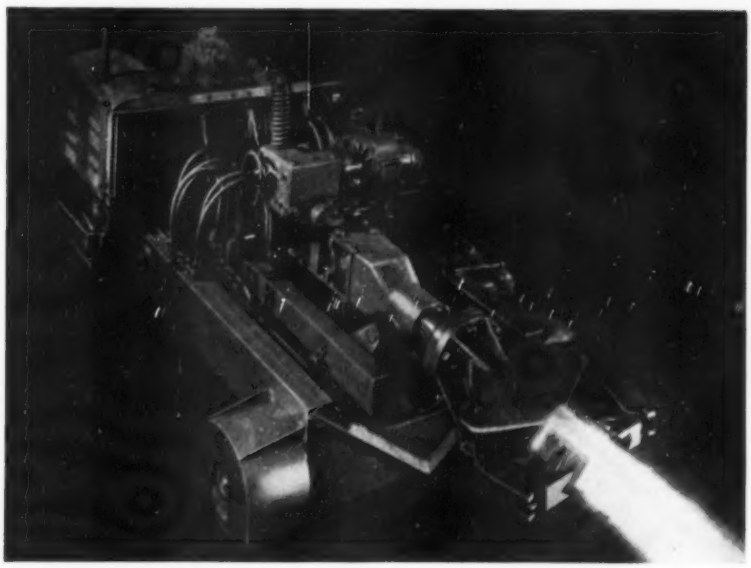


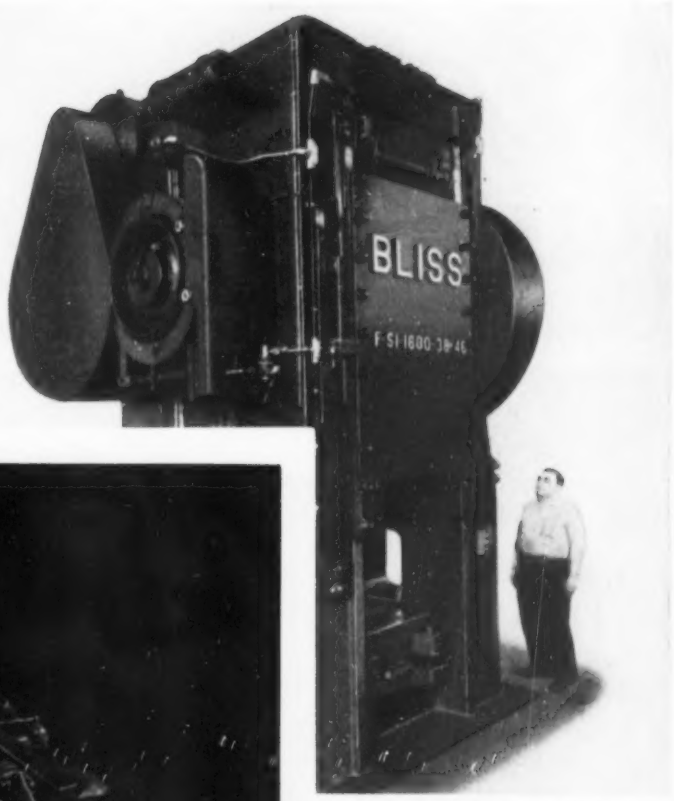
HYDRAULIC-HOSE ASSEMBLY — *Pyles Industries, Inc. subsidiary of Aro Equipment Corp, Detroit, Mich.* A hydraulic hose-coupling machine (floor space, 67x29 in.) does a complete assembly and swaging job. An operator using this machine can produce a finished hose, coupled at both ends, in 4 min.

POURING UNIT — *Ajax Engineering Corp, Trenton, NJ.* Ajaxomatic will feed molten metal, in particular aluminum, directly into the cold chamber of most die casting machines. The metal is taken from below the surface of the melt to avoid pouring surface

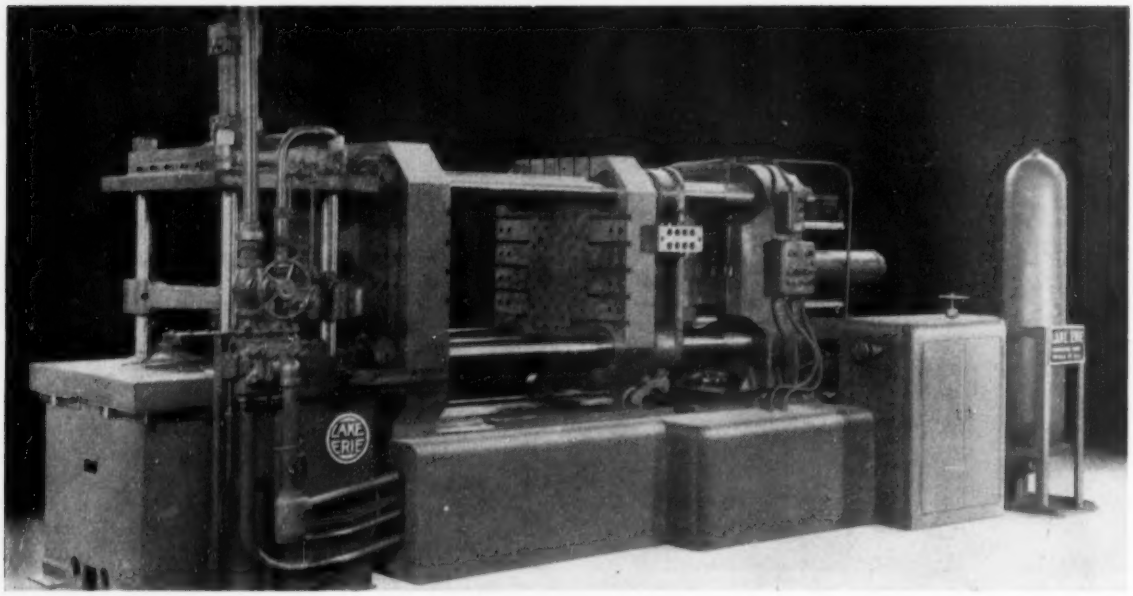
IMPACTER — *Chambersburg Engineering Co. Chambersburg, Pa.* A fundamentally new method of working metal—forging in mid-air with work struck from opposite sides by a pair of dies—"impacting" is performed in the Cecomatic Impacter. In forging a sphere to a disk, 23% less energy is required than in conventional flat die forging. Ratings of sizes represent the energy in thousands of foot pounds per blow. Engineering has been completed on sizes 4, 6, 10, 15, 25, 40, 65, 100, 150, 250, and 400.

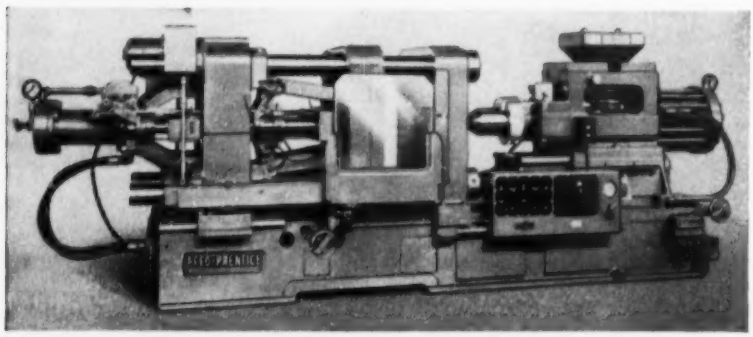
FORGING MANIPULATOR — *Salem-Brosius, Inc, Pittsburgh 15, Pa.* An improved wedge action in the tongs and a new positive-positioning feature in the tong shoes feature the Brosius Auto-Floor manipulators. The workhead has the following motions: rotating, tilting, and vertical and horizontal movements.





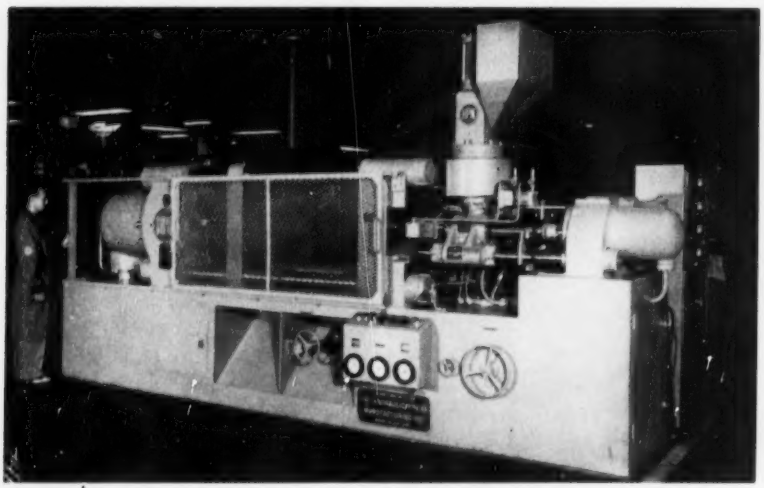
FORGING PRESSES—*E W Bliss Co, Canton, Ohio.* To assist smooth operation at the relatively high speeds at which these presses operate, a "buffer" cylinder is installed in the crown which assists the brake in stopping the heavy slide at top stroke and furnishes additional accelerating force when starting the slide, easing the load on the clutch. Capacities range from 300 to 4000 tons.





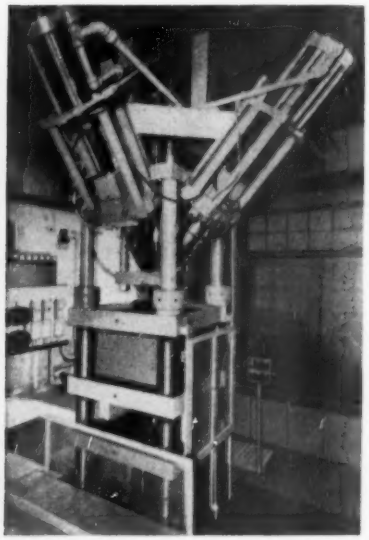
DIE CASTER—*Lake Erie Engineering Corp, 700 Woodward Ave, Buffalo 17, N Y.* Two features, the Wedge Cam Toggle and the Pressure-Pac injection unit are claimed to have increased production on this die caster as much as 15 to 25%.

INJECTION-MOLDER — *Reed-Prentice Corp, 677 Cambridge St, Worcester 4, Mass.* Designated the 400T model, this 16-oz machine will plasticize 110 lb of thermoplastic material per hr. Die platens of 35x40 in. accommodate larger molds and provide a 200-sq-in. casting area.



INJECTION-MOLDING MACHINE — *Hydraulic Press Mfg Co, Mount Gilead, Ohio.* Model 400-P-48 plasticizes the molding powder before it contacts the injection plunger. It has a 48-oz shot capacity, high injection speed, a mold clamp capacity of 400-tons, daylight opening of 54 in., 30-in. mold-clamping stroke.

DIE CASTER—*Cuyahoga Industries, 17920 Waterloo Road, Cleveland 19, Ohio.* Wedgelock, a cold-chamber die-casting machine, develops and holds 40,000-lb pressures without opening of die faces and flashing. Dies with 7½ in.-deep cavities can be run with an opening up to 15 in. maximum.



VERTICAL MOLDING MACHINE — *Worcester Moulded Plastics Co, Worcester, Mass.* Claimed to possess 25% more capacity than any plastic molding machine in existence. Four pre-plasticizing units preheat the material to give it greater flowing properties. This, together with 25% greater locking pressure on the dies, permit the molding of pieces in extra-large sizes.

1953 American Machinist Production Preview

WELDING AND HEAT-TREATING

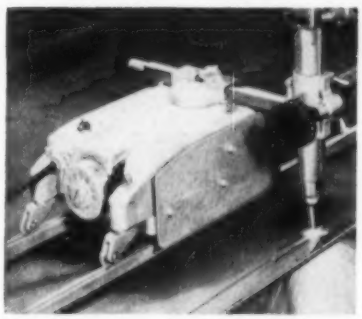
WELDING TORCHES — *Linde Air Products Co, Div of Union Carbide & Carbon Corp, 30 E 42nd St, New York 17, NY.* Two new Heliarc torches, HW-10 and HW-13 have rated capacities of 300 and 500 amps. The HW-10, weighing 12 oz, is designed for welding practically all commercial metals up to about ⅜ in. thickness. Cooling water flows directly into the torch body, providing direct water cooling to the electrode holder and reducing electrode stub loss. The HW-13 (illustrated) is specifically designed for machine welding.

CUTTING ATTACHMENT — *Union Carbide & Carbon Corp, 30 E 42nd St, New York 17, NY.* CW-122 fits on either of two welding blowpipes and cuts steel and other metals up to 8 in. thick. Because of large-dia oxygen delivery tube and improved mixer, only 55 psi in oxygen pressure is needed to cut 4 in. of steel; 100 psi will cut 8 in. 23 nozzles available for general purpose cutting and special jobs.

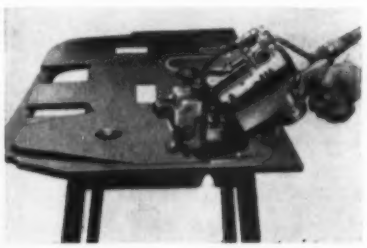
TORCH—*Arcair Co, 2614 Burwell St, Bremerton, Wash.* Arcair torch, a process of gouging and cutting all metals, uses only carbon arc and compressed air. The torch operates on dc welding current, has air-control valve, adjustable electrode angle.

CUTTING TORCH—*Manufactured by Browning Torch Corp, distributed by Steel News Industries, Inc, R D 22, Canonsburg, Pa.* This torch is claimed to do as much work on 70¢ worth of gasoline as the oxyacetylene torch can perform on a 100-fu ft tank of acetylene. The cutting head is said to eliminate backfiring and backflashing into the torch handle.

ACETYLENE GAS TORCH—*Velocity Power Tool Co, 7505 Thomas Boulevard, Pittsburgh 8, Pa.* Pistol-shaped Torch-O-Matic lights automatically and shuts off upon release, eliminating separate operation and equipment for relighting, manual valve adjustment, pumping or priming, and warm-up. Torch provides heat up to 280 F. Combustion tubes are available in three sizes, 1/8, 3/16 and ¼ in.



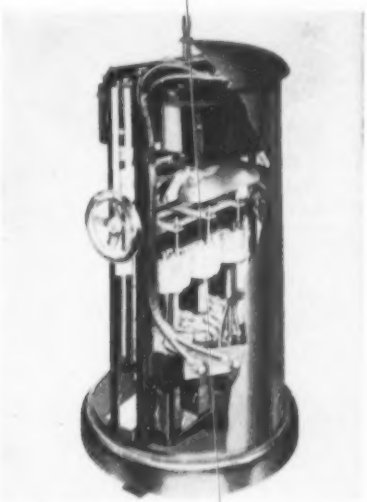
PORTABLE FLAME CUTTER—*Linde Air Products Co, Div of Union Carbide and Carbon Corp, 30 E 42nd St, New York 17, NY.* Oxweld CM-45 weighs 33¼ lb complete with blow pipe; because of its compactness, it can be employed in close quarters where larger machines cannot be used. Bevels can be cut at practically any angle—top or bottom—either in straight lines or circles. Circles with dias of 2 to 54 in. can be cut.



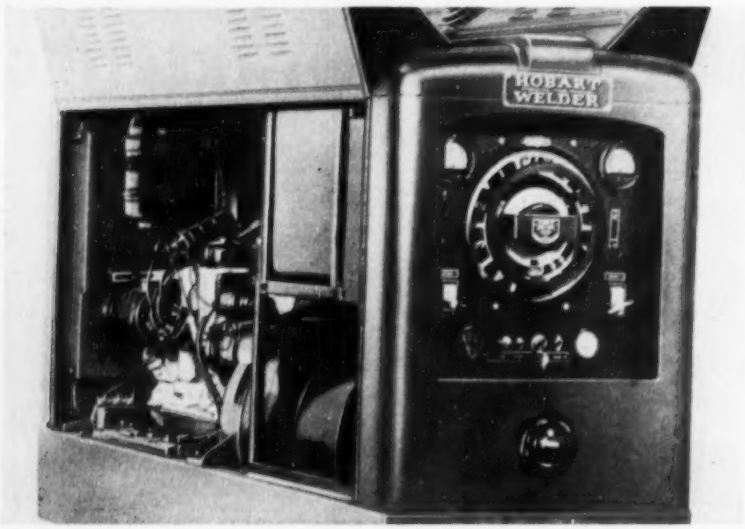
FLAME CUTTER—*American Pullmax Co Inc, 2455 N Sheffield Ave, Chicago 14, Ill.* Hand-operated flame-cutting machine which weighs only 19 lb will do plate cutting in thicknesses from 5/64 to 2¼ in.

ELECTRIC-WELD MILLS—*The Yoder Co, Cleveland 2, Ohio.* For producing non-ferrous tubing, come in three sizes with a total capacity range of ¾ to 8 in. dia, on metal thicknesses ranging from 0.025 up to 0.140 in. Available in coiled-sheet form, copper alloys, various brasses, nickel, monel, inconel, and stainless steels. Welding speeds range from 50 to 90 fpm.

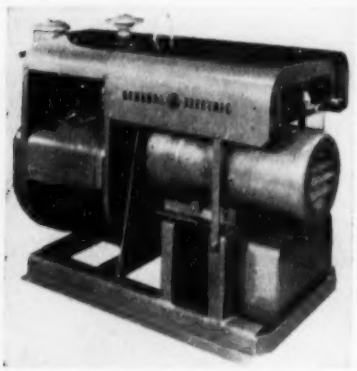
WELDING MACHINE — *The Lincoln Electric Co, Cleveland 17, Ohio.* AC welding machines in 300, 400, and 500-ampere capacity complete the Lincoln line of 6, 180, and 200-amp machines. A more compact design has the same high output and overload capacity, and incorporates the arcbooster circuit.



WELDING MACHINE—*A O Smith Corp, Milwaukee, Wis.* This machine is free of stack failures. This is accomplished by directing a high-velocity downdraft of cool air over the rectifier stacks before passing it through other parts of the machine. The blast is expelled at the base. Result is not only thorough cooling but also a cleaning action.



ARC WELDER—*The Hobart Bros Co, Troy, Ohio.* This gasoline-engine-driven arc welder has the control panel located at the generator end of the unit for easier adjustment of the welding heat. An oversize, inbuilt, 4-pole exciter provides prompt voltage buildup and is also a source of auxiliary power of 110 v, 1 kw.



DC ARC WELDER—*General Electric Co, Schenectady 5, NY.* A 200-amp, engine-driven dc arc welder with a 60% duty cycle known as the WD-42AGW has a current range of 40 to 250 amps, and can be used with a variety of electrode sizes. Consists of a GE WD42 generator and a Wisconsin air-cooled engine, and is designed to fit crosswise in a standard pickup truck.

ARC WELDER—*General Electric Co, Schenectady 5, NY.* Type WD-42AGW dc arc welder has a current range of 40 to 250 amp. It can be used with a variety of electrode sizes for repair, maintenance, and construction work. It includes a WD-42 generator and a Wisconsin air-cooled engine.

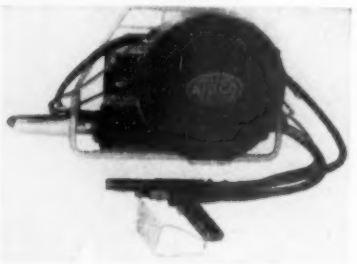
ELECTRONIC WELDER CONTROL —*Square D Co, 4041 N Richards St, Milwaukee 12, Wis.* Design of this electronic, non-synchronous resistance welder control has been simplified for easier installation, less maintenance, smaller size, and greater mounting versatility.

CONTOUR WELDER — *Linde Air Products Div, Union Carbide and Carbon Corp, 30 E 42nd St, New York 17, N Y.* Contour welds that formerly had to be made with manual apparatus can now be made semi-automatically with the Heliarc HWM-1 welder. Plain carbon steels and stainless steels in thicknesses from 0.020 to 0.125 in. can be welded.

ARC WELDERS — *Trindl Products Ltd, 17 E 23rd St, Chicago, Ill.* In three models, with Model 200A operating from 110 to 220 volts with a heat range of 20 to 200 amps, handling rods up to 3/16 in. on work up to 1¾ in. thick. The Models 300A and 400A operate from 220/440 volt lines, each with 36 different heat stages, ranging from 30 to 300 amps and 400 amps respectively.

ARC WELDER — *Miller Electric Mfg Co, Appleton, Wis.* Selenium rectifier dc arc welder is said to combine all the advantages of the ac transformer type and the dc motor generator welder. Provides a pulsating dc current for fast electrode deposition and sound, dense welds. Model 100, illustrated, is for light applications. Other sizes range up to Model 400 for heavy production welding.

ENGINE-DRIVEN WELDER—*Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* Light-weight, engine-driven welder also supplies 110 v, 60 cycle, single-phase power from a conventional plug-in outlet. Nominal rating of the welder is 200-amp, 40-v, 60 percent duty cycle with current range from 40 to 250 amp in accordance with NEMA standards.

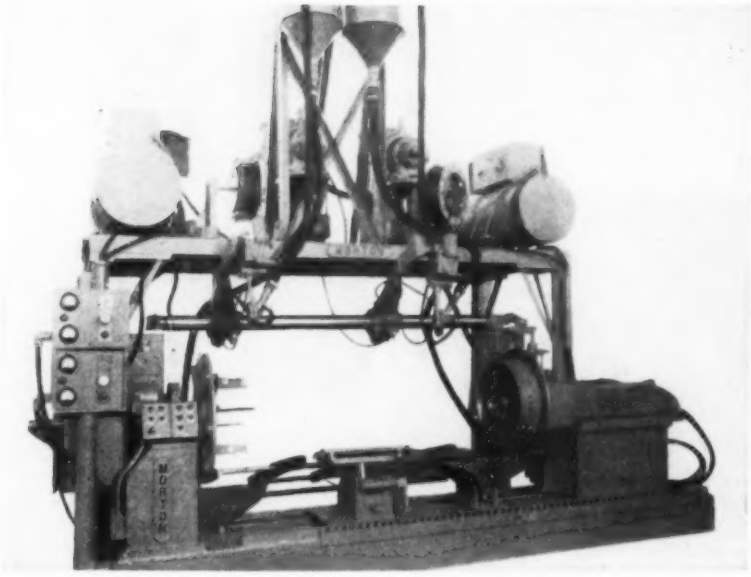


WELDING GUN—*Air Reduction, 60 E 42nd St, New York 17, NY.* Model No. 20 Aircomatic gun is designed for manual inert-gas shielded metal-arc welding. Operates with currents up to 500 amp. Use of internal water cooling of the gun, and a water-cooled welding cable permit high current capacity without sacrificing lightness and flexibility.

AC WELDERS — *Metal & Thermit Corp, 100 E 42nd St, New York 17, N Y.* Features of this redesigned line of ac welders include insulation with silicone which is unaffected by chemical fumes and vapors. The line is available in 200, 300, 400 and 500 amp ratings.

HARDFACING PROCESS — *Air Reduction Co, 60 E 42nd St, New York 17, NY.* This process uses a standard automatic Heliweld head and a unit for feeding bulk tungsten carbide. The carbide particles are poured into pool behind the arc. The rate of particle feed from the vibratory hopper mounted on the head is electrically controlled to high accuracy.

CADWELD PROCESS — *Erico Products, Inc, 2070 E 61st Place, Cleveland 3, Ohio.* Being used to weld large conductors, is claimed to give consistent performance under extremely heavy currents, and to maintain 100% electric efficiency under adverse conditions such as heat and corrosive atmospheres.



GIRTH-WELDING MACHINE—*Morton Mfg Co, Muskegon Heights, Mich.* Has a tilting table with variable rotation speeds. Columns supporting the table also support overhead platform for mounting power source and allied equipment. Vertical operation of the saddle is either manual or power driven under operator control. All controls are located on a pendant station. Table will carry a maximum load of 10 tons, 6 in. eccentric and 6 in. above the table.

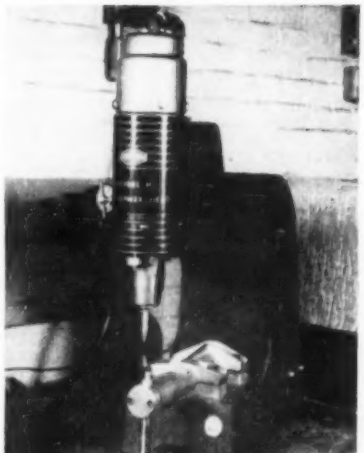
WELDER — *Precision Welder and Flexopress Corp, 138 E McMicken Ave, Cincinnati 10, Ohio.* A direct relationship between current and pressure provides good welds in critical applications such as electrical contact welding, aluminum crosswire welding and many others.

PRESS AND GIRTH WELDER—*Morton Mfg Co, Broadway and Hoyt, Muskegon Heights, Mich.* Model E is designed to make fillet and burn-through circumferential welds. Has a built-in, 5-ton hydraulic press for assembly of parts prior to welding. Unit has a capacity 9 in. to 24 in., 12 in. to 36 in., or 18 in. to 48 in. dia and up to 96 in. long.

WELDER—*Miller Electric Mfg Co, Appleton, Wis.* The SR-100 welder employs unusually low currents on light gages. It is a selenium rectifier DC welder having a range from 8 to 135 amp. Machine is designed to operate 220/440, 3-phase, 60-cycle current.

PORTABLE STUD WELDER — *Graham Mfg Corp, 1643 National Bank Bldg. Detroit 26, Mich.* Simple construction of the stud holder provides a wide variety of stud sizes and shapes, including hooks, and headed studs in a wide variety of sizes up to ½ in. dia.

WELDER AND CHARGER — *Mid-State Welding Mfg Co. 6025 S Ashland Ave, Chicago 36, Ill.* Combination ac arc welder and battery charger is reconnectable for 110- or 220-v operation. The combination handles rods from 1/16 to 3/16 in. and is also available without the battery charging circuit.

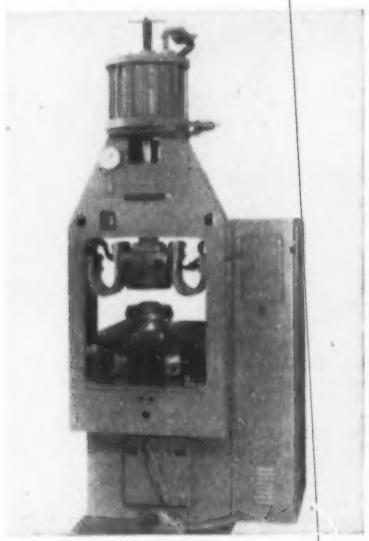


WELDING HEAD—*Raytheon Mfg Co, Waltham 54 Mass.* Foot-operated welding head has controlled follow-up and a visual pressure gage. Additional upper arm can be attached for series welding. Can be used for percussion work by attachment of an adjustable firing cam.

ELECTRIC WELDER — *Miller Electric Mfg Co, Appleton, Wis.* This small ac welder can be used on standard 110- or 220-v power supply line and will handle electrodes from 1/16 to 5/32 in. (when on 110 v the maximum is ⅛-in. electrode).

SPOT WELDING—*P R Mallory & Co, Inc, 3029 E Washington St, Indianapolis 6, Ind.* Nu-Twist holders and electrodes for forces over 6000 lbs are designed with flat mating surfaces between holder and electrode which eliminates threaded and tapered connections. Manually operated electrode locking nut requires no tools, permitting easy removal and replacement.

RESISTANCE WELDER—*The Taylor Winfield Corp, Warren, Ohio.* Makes the liner for the cold wall of a low-temp refrigeration compartment by welding aluminum to aluminum. Multiple high-speed wheel dressing unit removes the aluminum picked up on the copper welding wheels. Approximate rate of operation is 120 panels per hr.



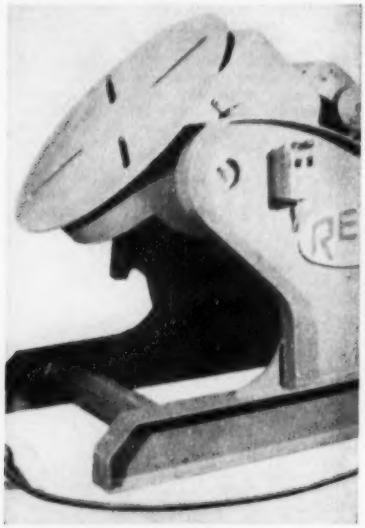
RESISTANCE WELDER — *Taylor-Winfield Corp, Warren, Ohio.* Designed to weld reinforcements in automotive brake drums. Has low power demand for heavy-duty multiple projection welding.

SPOT WELDER—*Joyal Products, Inc, 56 Belmont Ave, Newark 3, N J.* Resistance spot weldig and soldering machine features a quick adjusting device for pressure control and length of electrode travel. Known as the Model 5000 WVS, it spot welds steel parts up to 3/16 in. in thickness.

WELDING — *Metallizing Engineering Co, Inc, 38-14 St, Long Island City 1, N Y.* The Metco Sprayweld process provides a fast, economical method of hardfacing parts subject to excessive wear and abrasion. The wire used, Metco-Weld H, is a hard, non-sparking, non-magnetic alloy possessing great resistance to wear and corrosion. It is claimed to out-wear hardened steels by from 3 to 10 times.

TRANSFORMER WELDER — *Miller Electric Mfg Co, Appleton, Wis.* Miller Model 44 is an ac transformer welder which is reconnectable for use on 110-v ac, single-phase, 60-cyle power lines. It incorporates two ranges, the low range for electrodes up to ⅛ in. on 220 v, and the high for 5/32-in. electrodes on 220 v.

SHEET-METAL JOINER—*Standard Power Groove Machine Corp, 99 Hudson St, New York 13, N Y.* This machine is made to automatically seam sheet metal of any thickness from 18 to 30 gage. Powered by a 2-hp motor, the roller assembly travels along a screw spindle over the work twice—once in each direction, and 8 ft can be traveled in 40 sec. The unit can accommodate any size sheet for seaming up to 6 ft wide by 8 ft long.

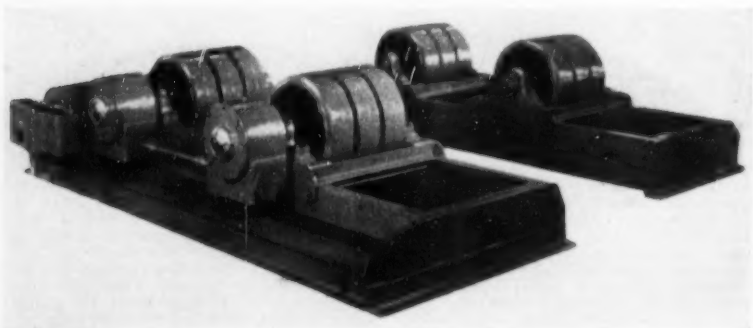


WELDING POSITIONERS—*Reed Engineering Co, 1003 W Fairview Ave, Carthage, Mo.* These welding positions are available in two models; one with 1000-lb capacity. The design features a compact three-in-one table tilting frame. Rotation speed can be varied through a 10 to 1 speed range.

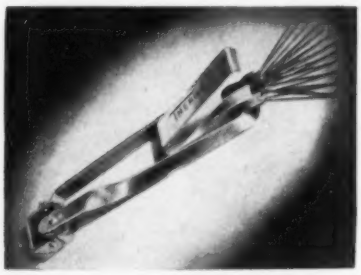
WELDING POSITIONER — *Syracuse Special Machine Co, 4010 Court St, East Syracuse, N Y.* Positioner consists of a cradle which is power rotated through 180° so that welding can be performed on both sides of the assembly. The work is carried on a variable-speed rotating spindle and is enclosed by power-operated insulated doors equipped with welding ports.

WELDING POSITIONER — *Aronson Machine Co, Arcade, N Y.* Table rotates at any infinitely variable speed from 0 to 2.7 rpm, 4-rpm constant speed for quick positioning. Pushbutton control station provides either variable or constant speed. Speeds are indicated on an electric generator tachometer to as close as 0.025 rpm with no fluctuations of the knife-edge needle. The 2-hp, forward-or-reverse motor runs during the welding cycle, allowing instant start and stop of the table through ICB electric clutches and brake.

TURNING ROLLS—*Reed Engineering Co, 1003-17 Fairview Ave, Carthage, Mo.* Have a capacity of 75 tons with one power unit and two idler units, and handle vessels up to 14 ft. in dia Motor, variable-speed transmission, and gear reducers are in one compact set with a range of from 5 to 40 ipm.



WELDER-POSITIONERS — *Dean Weld Machine, Inc, 10154 Edes Ave, Oakland, Calif.* For rebuilding crawler tracks, fabricating, and hard facing. Entire track can be placed on the bed. Welder automatically breaks arc at each rail joint and restarts on next link. Positioned bed is 40 ft long, with extra 10-ft sections available. Includes 500-amp welder.



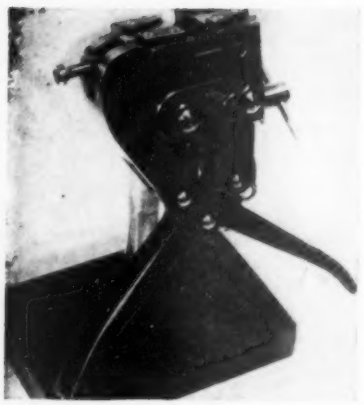
SPARK LIGHTER, TIP CLEANER—*Thermacote Co, 301 Mount Pleasant, Newark, N J.* 12 spiral-tipped cleaners are attached directly to the handle of the spark lighter in a handy case. The combination is known as Tip-O-Liter.

WELDING GANTRY — *Hillco, Inc, 2741 East Latimer, Tulsa, Okla.* Specially designed gantry for semi-automatic welding units features a rapid, tridirectional adjustment for the welding gun. Entire unit fits compactly on a caster stand. All circumferential welds from practical minimum to 54 in. in dia. can be made with the standard rack.

WELDING-CABLE CONNECTOR — *Cam-Lok Div, Empire Products, Inc, PO Box 98-D-1, Cincinnati, Ohio.* Design consists of a double cam principle where one cam exerts pressure parallel to the axis of the connector, and the other perpendicular to the axis. General purpose Cam-Lok connectors (for 1/0 through 3/0 cable and No. 2 through 1/0 whip ends) are completely interchangeable with heavy-duty connectors and heavy-duty female terminal connectors.

BARE ALUMINUM RODS—*All-State Welding Alloys Co, Inc, White Plains, N Y.* Equally applicable with ac or dc electric and oxy-acetylene welding equipment. Standard diameters include 1/16, 3/32, ⅛, 3/16, and ¼ in. Standard length is 36 in.

WELDING POSITIONER — *Aronson Machine Co, Arcade, N Y.* The Model HST 5, head- and tail-stock welding positioner has a capacity of 5000 lb. Table rotation of 1.13-rpm constant speed, magnetic brake motor, magnetic reversing starter, motor enclosed within chassis.



TOOLS COLD WELDING—*Utica Drop Forge & Tool Corp, Utica, NY.* Hand tools for cold pressure welding of such non-ferrous metals as aluminum and copper operate on the pliers principle, one for wire and one for sheet. Compact, portable tools weigh only a few pounds.

WELDING ELECTRODE — *Weiger Weed & Co, Div Fansteel Metallurgical Corp, 11644 Cloverdale Ave, Detroit 4, Mich.* Kaptrode consists of an expendable cap which fits into a semi permanent adapter shank. This in turn fits in to any standard Morse taper electrode holder. Electrodes are made in six nose styles: pointed, dome, flat, offset, truncated cone and radius face.

CAP ELECTRODE—*Weiger Weed & Co, Div of Fansteel Metallurigcal Corp, 11644 Cloverdale Ave, Detroit, Mich.* Fits into a semi-permanent adapter shank, which in turn fits any standard electrode holder of No. 3 Morse-taper size. For spot welding, the electrodes are made in six nose styles, including pointed, dome, flat, offset, truncated cone and radius face, and in three RWMA alloys.

ELECTRODE STABILIZER — *Fred C Archer, Inc, Milwaukee 3, Wis.* For use in low-hydrogen welding processes, has a self-locking stacking arrangement. It is said to stabilize the moisture content of the low-hydrogen electrode coatings at the peak of their efficiency.

HARD-FACING RODS — *Metal & Thermit Corp, 100 E 42nd St, New York 17, N Y.* Acetylene-welding electrodes include rods for extreme abrasion, medium and heavy impact, severe shock, high red hardness, and extreme heat and corrosion resistance. Another is a Murex tungsten-carbide rod for slag-free deposits.

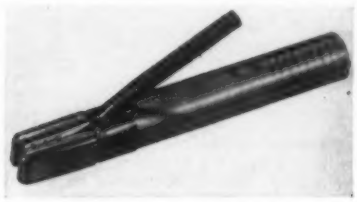
ELECTRODE—*Eutectic Welding Alloys Corp, Dept P, 172nd St and Northern Blvd, Flushing 58, N Y.* An electrode has been made that will gouge, chamfer, clean, and partially mill armor plate and similar difficult-to-cut alloys.

WELDING ELECTRODE — *Eutectic Welding Alloys Corp, Dept P 172nd St at Northern Blvd, Flushing, N Y.* For cast iron, it eliminates critical nickel from its content. While it does not replace nickel-bearing electrodes on all applications, it offers a high-tensile weld with a uniform amount of carbon in the deposit.

RESISTANCE WELDER ANALYZER —*The Brush Development Co, 3405 Perkins Ave, Cleveland 14, Ohio.* The Model BL-213 welding analyzer records the special variables present in the operation of three-phase resistance welding machines. The analyzer consists of a universal amplifier, a modified dc amplifier, and a special dual-channel direct-writing oscillograph.

ELECTRONIC WELDER CONTROL —*Square D Co, Milwaukee 12, Wis.* Simplified design of this electronic synchronous resistance welder control. Results in easier installation, less maintenance, smaller size, and greater mounting versatility.

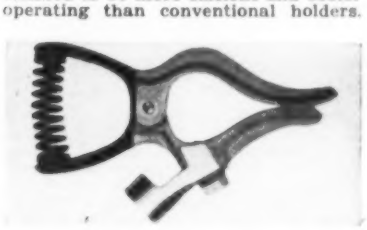
ELECTRODES OVEN — *Despatch Oven Co, Minneapolis 14, Minn.* This welding-rod drying oven is said to assure high-welding efficiency by completely eliminating moisture absorption in low-hydrogen and other coated electrodes.



ELECTRODE HOLDER — *Cam-Lok Division, Empire Products Inc, PO Box 98-D, Cincinnati, Ohio.* The loading trigger on this electrode holder is operated with one hand without fumbling. The position of the jaws eliminates rod bending and makes welding in cramped spaces easier. Available in three sizes: Heavy-duty (500 amp); general purpose (300 amp); and light duty (200 amp).

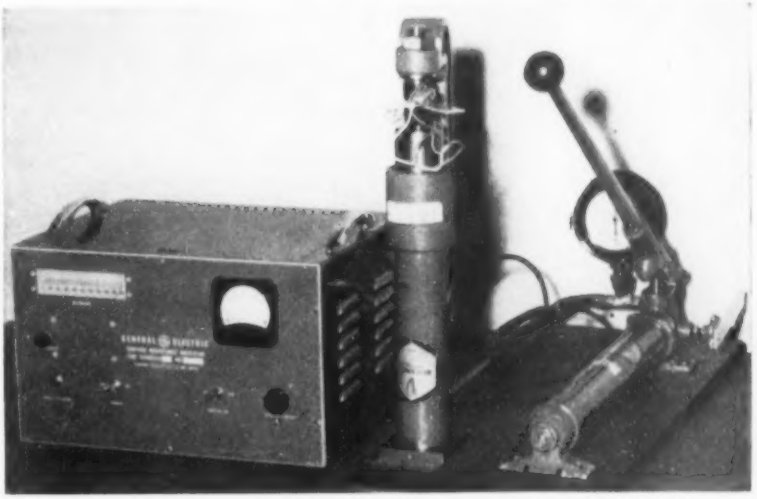
ELECTRODE HOLDER—*Tweco Products Co, P O Box 666, Wichita, Kan.* 300-amp Model A-732 Twecotong electrode holder features a light-weight, high-copper alloy for maximum conductivity. Unit handles from 7/32-in. through 1/16 in. electrodes.

ELECTRODE HOLDER—*Erico Products Inc, 2070 E 61st Place, Cleveland 3, Ohio.* The Caddy Type-B, 500-a electrode holder weighs only 25 oz and is claimed to be more efficient and cooler operating than conventional holders.

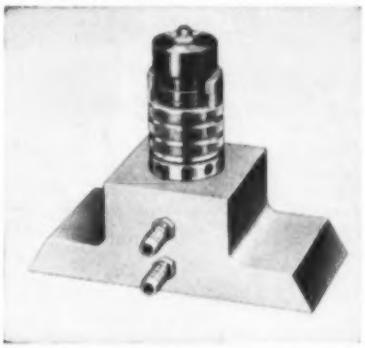


GROUND CLAMP — *Tweco Products Co, Box 666, Wichita, Kansas.* Model GC-200 Cub ground clamp is rated at 200 amp. It has a protruding upper lip for extra leverage in applying the clamp.

SHEET-METAL CLAMPS—*Monogram Mfg Co, 2204 Colorado St, Santa Monica, Calif.* These clamps are made in five basic styles for various applications. Sizes range from 3/16- to 1½-in.-thick material and fit drill holes from 0.096 to 0.350 in.



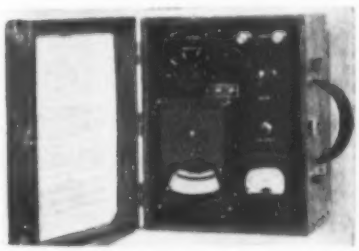
WELDER'S TRUCK — *Palmer-Shile Co, 15019 Fullerton, Detroit 27, Mich.* Welder's truck accommodates one gas and one air cylinder in individual cradles. Strong safety chain anchors the cylinder securely. A tool box for torches, tips, etc., is located between the handles.



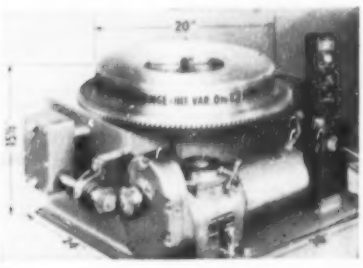
DIE ADAPTER—*P R Mallory & Co Inc, 3029 E Washington St, Indianapolis 6, Ind.* For short-run resistance welding, the Nu-Twist die adapter permits the same die to be used for different operations. A change of electronic inserts is all that is necessary to adapt the die for spot welding, electrical upsetting, and electro-brazing.

GAS-WELDING FLUX — *All-State Welding Alloys Co, Inc, White Plains, N Y.* For 2S and 43S aluminum and stainless steel. It is known as All-State No. 35 Flux.

INDICATOR — *General Electric Co, Schenectady 5, N Y.* This surface-resistance indicator is designed to produce a better resistance welding bond by providing a rapid, accurate measurement of resistance between pieces of metal to be welded. The unit has two ranges: 0-200 and 0-2000 microhms; measured resistance is indicated directly in microhms on a linear 100-div scale.



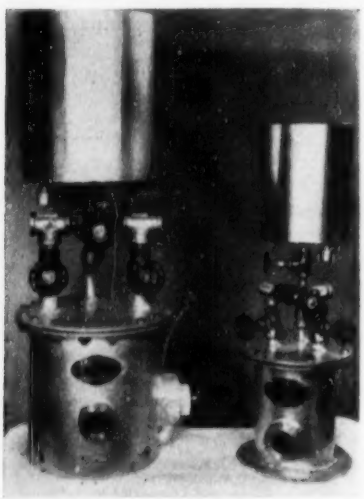
WELDING CLEANLINESS—*J W Dice Co, Englewood, N J.* The Model 151-S Microhm Meter measures the total surface resistance of two sheets or coupons, when placed between two dummy electrodes. It can accurately measure a resistance as low as one millionth of an ohm and the readings are almost instantaneous.



TURNTABLE—*Aronson Machine Co, Arcade, N Y.* Model X-20115 turntable can be mounted on a bench, the floor, or a pit. With the 9-in. hole in the center spindle shafts can be positioned without special fixturing. Variable table speeds range from 0 to 1.2 rpm.

SOLDERING IRON—*General Electric Co, Schenectady 5, N Y.* A standard-voltage, lightweight soldering iron, designed for high-speed soldering in close quarters has been developed by GE.

ELECTRIC SOLDERING IRON — *Hexacon Electric Co, 135 W Clay Ave, Roselle Park, N J.* For use on fast production lines where greater speed is required from an iron with a small tip diameter. This iron is the plug-tip type rated at 150 watts with a ¼-in.-dia tip.



GASFLUXER MODELS—*Gasflux Co, 198 Wayne St, Mansfield, Ohio.* Model 68 Gasfluxer, designed primarily for use with city gas, has a 3-valve bypass to regulate amount of flux delivered to the flame. 1-gallon capacity reserve tank. Model SFH fluxes 100 to 120 cu ft of fuel gas per hr, has a 5-gal. reserve tank.

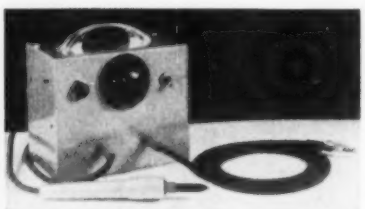
SOLDERING CREAM—*Farrelloy Co, 1217 N 26th St, Philadelphia 21, Pa.* Buffed to reduce corrosion and does not give off toxic fumes. The activity of the flux has been increased without the use of mineral acids, thus the metal is protected from corrosive attack.

SOLDERING IRON — *Hexacon Electric Co. 135 W Clay Ave, Roselle Park, NJ.* Designed for pinpoint accuracy on precision work weighs only 3 oz with a ⅛-in. dia tip, and is rated at 25 watts. Requires no transformer to operate. Available for either 110 or 220 v, dc or ac.

SOLDERING-GUN — *Wen Products, Inc, 5806 Northwest Highway, Chicago 31, Ill.* This soldering gun is a transformer soldering device which heats instantly in 3 to 5 sec. when trigger is pressed. It operates on 250 watts, 110-120v ac. Soldering tips are replaceable.

FILLING SOLDER — *Swiss Laboratory, Cleveland, Ohio.* With aluminum as the principal ingredient, takes 50% less heat than tin alloy solder and fills without fluxing or shrinking. Known as Fil-Soder, it is suitable for all metal filling.

COLD SOLDER—*A L Okun, Distributor, 148-26 5th Ave, Flushing 55, New York, N Y.* Made of fine metallic aluminum and a quick-drying non-soluble vehicle is being made in a more jellied state. This means easier application and more area covered per unit volume.

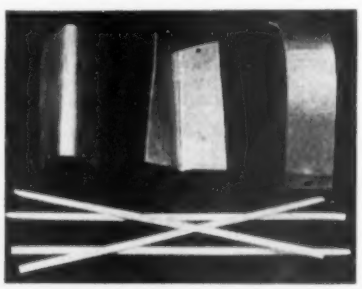


RESISTANCE SOLDERING UNIT — *Sunrise Products Co, P O Box 173, Hawthorne, N Y.* Model K-72 soldering unit has an adjustable heat control which allows the electrodes to heat up to 1500 F almost instantly.

STABLE, NON-ACRID FLUX—*Farrelloy Co. 1217 N 26th St, Philadelphia 21, Pa.* For soldering copper, brass, steel and terneplate is a fast scavenger at low heat, will withstand a wide temp without oxidizing, does not fume, and can be used with either torch or soldering iron. Known as Wetoil, it contains alkaline buffers.

TAPE SOLDER—*The Blonde Oil Co, Solder Div, 464 Woodward Ave, Brooklyn, N Y.* 40/60 tin-lead alloy containing rosin flux. A package is 2½ ft in length by ⅜ in. width and contains enough solder for 100 connections. No soldering iron or tools are needed since a connection may be made with a single match or a candle.

ORGANIC BOND — *ChemoTec Division, Eutectic Welding Alloys Corp, 172nd St & Northern Blvd, Flushing 58, N Y.* A bonding agent known as ChemoTec is able to join metals to each other, to similar or dissimilar metals, or to non-metallic materials. In rod form, it is applied with a welding-rod technique, but at a much lower heat. It bonds by capillary and chemical action. Tensile strengths in excess of 5000 psi have been obtained.



ALUMINUM BRAZING—*A E Ulmann & Associates, 342 Madison Ave, N Y, 17, N Y.* Brazing process for aluminum and its alloy can replace high-temperature welding with simple equipment and unskilled labor. Known as Brazinal, the metal has the following properties: melting point of 880 F, 45,000-psi tensile strength, and hardness of 80 Bh.

SOLDERING IRON—*Paul C Roche Co, 11 Park Place, N Y 7, N Y.* German-made Primax Solderer reaches soldering heat within six seconds. A current of high amperage is produced in the transformer which brings soldering tip to almost instantaneous high soldering point. 22-oz unit has a special alloy tip which never needs retinning. Available for 110 or 220 v, 50/60 cycles.

SILVER BRAZING FLUX—*Goldsmith Bros Smelting & Refining Co, 1304 W 59th St, Chicago 36, Ill.* G-B No. 99 is claimed to have exceptional ability to climb and spread over entire joint area, providing max action during brazing. Quickly dissolves metallic oxides, permitting a uniform flow of silver solder. Fully active through a low temp range of 800-1350 F.

HARD-CHROME PLATING UNIT — *The Cro-Plate Co Inc, Hartford, Conn.* This bench-model plating unit requires a space of only 2x3 ft, yet all controls, transformers, rectifiers, switches and heating elements, including the plating tank are contained within the unit. The unit provides a rectified source of dc power up to 100 amps at 0 to 12 volts.

TONG BRAZING—*Westinghouse Electric Corp, 306 Fourth Ave, Pittsburgh 30, Pa.* The power supply for incandescent-carbon tong brazing has been greatly improved. A larger water reservoir is provided, and a pump with more positive pressure gives more effective cooling. Piping is arranged so that water need not be drained when changing tongs. Both sizes have been increased in capacity—from 20 to 40 to 25 and 50 kva.

CHROME-PLATING UNIT — *Industrial Chrome Div, Ward Leonard Electric Co, Mount Vernon, N Y.* 250-a Chromaster is able to chromeplate small tools or parts in large quantities, or large parts up to 125 sq in. area. Average plating time using Chromasol solution is 3½ min for cutting tools.

FILLER—*Cook Paint and Varnish Co, Detroit, Mich.* Process involves the application of Chrometeseal. A composition which permanently fills and seals minute imperfections in solder-metal surfaces, insuring against breakthroughs or eruptions of the paint finish.

METAL SPRAY GUN — *The Cooper Alloy Foundry Co, Hillside 5, N J.* Improved model Spray King, designed for low-melting alloys and metals. It is said that marginal alloys in the 500 to 650 F class will now be easily sprayed. Capacity is 7 lb of low-melting alloy.

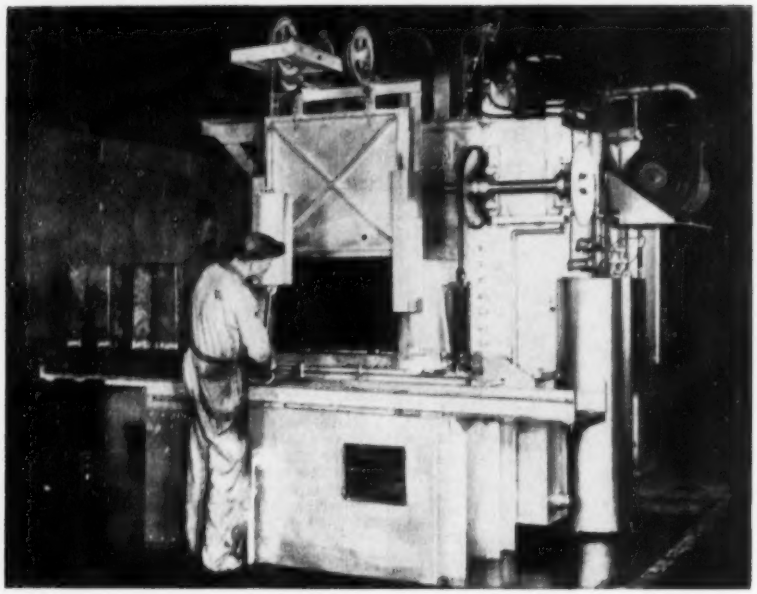
SILVER BRAZING ALLOY — *Handy & Harmon, 82 Fulton St, New York 38, N Y.* Primarily for brazing chromium carbide, cast carbides, and other hard-to-wet carbides, alloy is composed of 50% silver, copper, maganese, and tin. It has a melting point of 1120 F, and a flow point of 1345 F.

SILVER BRAZING—*American Silver Co, Inc, 3607 Prince St, Flushing 54, NY.* Braz-Clad metals eliminate voids and oxide islands, and produce joints effective over 100% of the bonding area. They are combinations of various base metals, ferrous and non-ferrous, clad with a predetermined thickness of silver brazing alloy on one or both sides.

BRAZING — *American Electro Metal Corp, Yonkers, NY.* High-temperature brazing of molybdenum and tungsten electronic components is done with a powder that melts at a temperature of 3450 F and forms a continuous, strong braze upon solidifying. Known as Mobraze.

BRAZING ALLOY — *Westinghouse Electric Corp, 306 Fourth Ave, Pittsburgh 30, Pa.* Phos Copper is available in paste form. An alloy of copper and phosphorous, its fluidity and wetting properties are good capillary action that enables it to penetrate tight-fitting joints to form a strong, ductile bond.

BRAZING FLUX—*Handy & Harmon, 82 Fulton St, New York 38, N Y.* For use in the joining of titanium, zirconium, and their alloys. Surfaces protected by the flux are readily wet by silver brazing alloys. It is available in ½-lb jars.



FURNACE — *Surface Combustion Corp, Toledo, Ohio.* Batch furnace is capable of case and homogeneous carburizing, dry cyaniding, clean hardening, and carbon restoration at high production rates. It is available in two capacities—500 and 1600 lb per hr. gross. The operating temperature range is 1450 to 1750 F.

DOUBLE-END FURNACE — *Surface Combustion Corp, Toledo 1, Ohio.* 40 ft long from door to door, will be used for the critical preheating and thorough dewaxing of molds used in precision casting. Five progressive zones, each with automatic temperature control assure dimensional stability through controlled expansion of the investment mold.

BENCH FURNACE—*Cooley Electric Mfg Corp, 905 Daly St, Indianapolis, Ind.* VK-7 furnace has chamber dimensions of 10x6x18 in. and heating elements of 6.5-kw capacity at 220-v single phase on all four sides of the chamber and in the door. This provides even heat distribution and close temperature uniformity.

BOX FURNACES — *Cooley Electric Mfg Corp, 915 Daly St, Indianapolis 2, Ind.* Formerly available in three standard sizes with working chamber dimensions of 12x18x18 in., 12x8x24 in., and 12x8x36 in., this furnace has a chamber size of 15x12x30 in.

RADIATION-TEMPERATURE DETECTOR—*Leeds & Northrop Co, 4907 Stenton Ave, Philadelphia 44, Pa.* Permits sighting between coils of an induction heater to measure temperature of the work itself. Known as the Rayotube, it can sight on a target only 0.1 in. in diameter from a distance of 4 in.

PORTABLE ELECTRIC OVEN — *Grieve-Hendry Co, Inc, Chicago 22, Ill.* Equipped with Inconel sheathed sealed tubular heating element for greater efficiency, the unit has a thermostat control with temp range of 300 to 1000 F. Two or more ovens can be used in a group, as they are nest-constructed; individual banked units may be cut out, or operated at different temps.

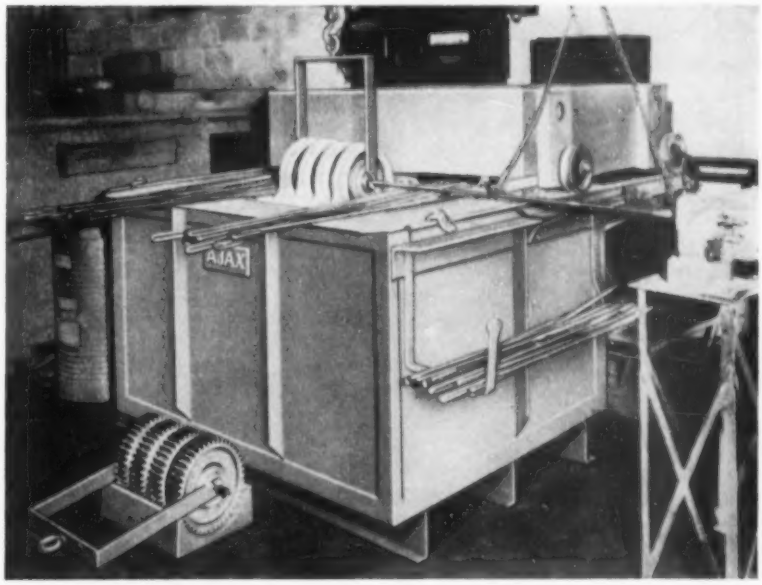
CARTRIDGE HEAT TREATMENT—*A D Alpine, Inc, 11837 Teale St, Culver City, Calif.* Method of blanketing metals with hydrogen, nitrogen, carburizing, or other atmospheres while they are being heat-treated in a small shop furnace. A cartridge is employed which contains the parts to be treated.

TEMPERING UNIT — *Ipsen Industries, Inc, 715 S Main St, Rockford, Ill.* D300 makes possible both bright, scale-free tempering, and controlled oxidation tempering from 400 to 1400 F. It is a sealed, controlled-atmosphere furnace. Since the oxygen is controlled while tempering, a bright surface is produced. Furnace can also produce a controlled oxide coating.

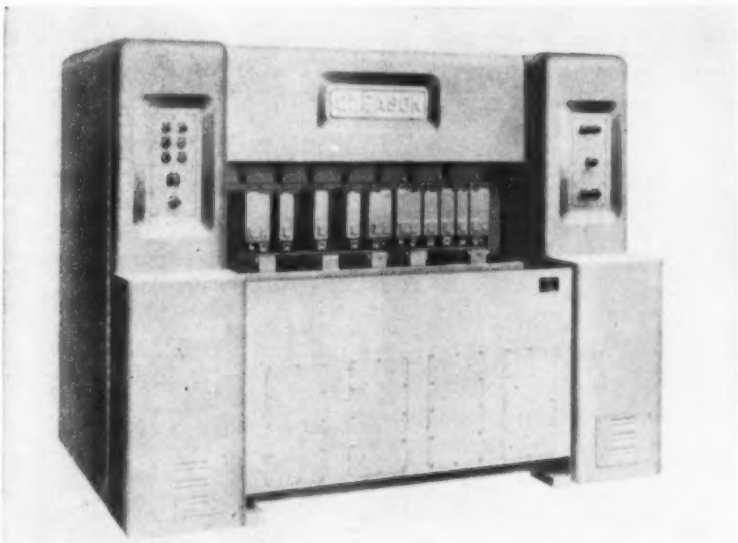
HEAT-TREATING UNIT—*Ipsen Industries, Inc, Rockford, Ill.* Automatic Sealed Atmosphere and temperature control, and automatic transfer of work from heat through the quenching cycle, 500-lb-per-hr Model T-500, available for either electric or gas-fired operation.

HEATING UNIT—*Lewis Machine Co, St Paul, Minn.* High-frequency Lewis 1500 can be used with either ferrous or non-ferrous metals for soldering, brazing, hardening, annealing, and other controlled-heat applications. Weighing 350 lb, unit is controlled by an automatic timer switch which may be preset from zero to 60 sec.

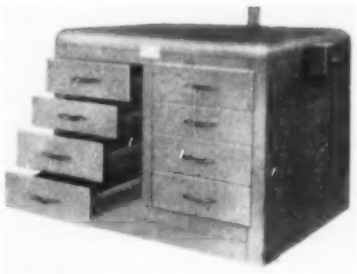
HEATER—*Lindberg Engineering Co, 2450 W Hubbard St, Chicago 12, Ill.* Model **LI-50A-1** high frequency induction heating unit provides more than 50 kw at 400,000 cycles per sec. on a 100 percent duty cycle. Closed water system circulates temperature controlled water to the oscillator tube and tank coils. Input power is 230, 460, 550 volts, three-phase, 60 cycle, with a maximum of 100 kva at 90 percent power factor.



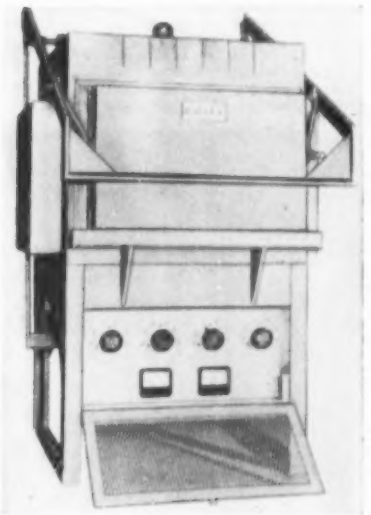
SALT-BATH FURNACE—*Ajax Electric Co, Inc, Frankford & Delaware Aves, Philadelphia 23, Pa.* New application of Ajax salt bath furnace allows selective heat-treatment of the rim or edges of circular edges, hardening teeth on gears or sprockets, and other products that require peripheral heating. A number of the parts can be mounted on a shaft within a suitable fixture which is placed over the bath.



ROLLING QUENCH MACHINE — *Gleason Works, 1000 University Ave, Rochester, NY.* Holds and quenches heated shafted parts so that they may be hardened with a minimum of distortion. Hot part is placed on the lower rollers and the start buttons depressed until the quench cycle starts. From this point on the operation is automatic. The upper roller holds the part, forcing it against the lower rollers. Some of the lower rollers are rotating and when pressure is applied the part is rotated in a quenching medium for a predetermined time.



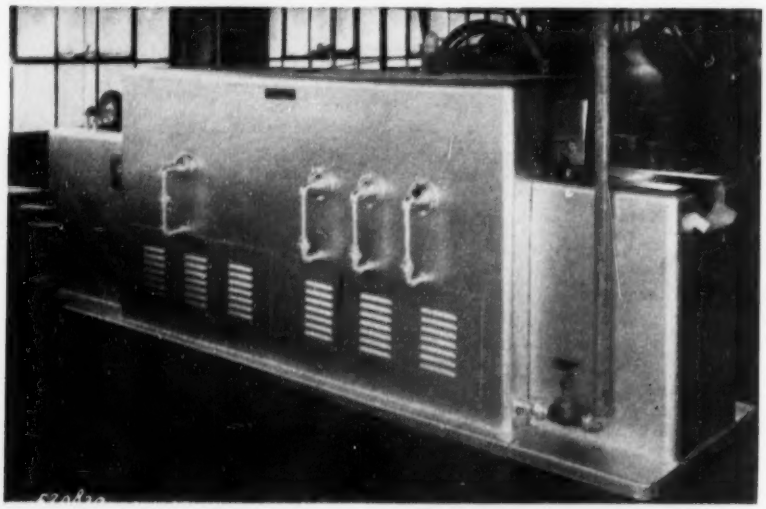
PORTABLE OVEN — *Grieve-Hendry Co, Inc, 1101 North Paulina St, Chicago 22, Ill.* Has eight drawers that permit baking of different materials at the same time, or materials inserted at intervals. Heating is provided by high-temp magnesium units. Weight is only 118 lb. Temp control is by thermostat and is adjustable up to 325 F.



HEAT-TREATING FURNACES — *Cooley Electric Mfg Corp, 38 S Shelby St, Indianapolis 7, Ind.* Line of electric furnaces for hardening high speed steel has operating temperatures of 1650 to 2500 F. Three models have chamber sizes of 6½x9, 12/8x18, 12x8-x24 in.

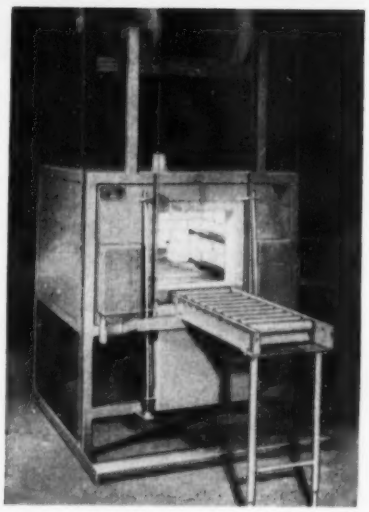
FURNACE — *Furnace Div, Delaware Tool Steel Corp, Wilmington 99, Del.* Designed for heating chisel blanks. Forgeatrol furnace heats work end but retains shank temper. Controlled temperatures from 1200 to 2800 F are maintained. The shanks remain cool because the work tile both blocks heat loss and shields the chisel bodies.

FURNACE—*K H Huppert Co, 6830 Cottage Ave, Chicago 37, Ill.* Built for 2200 F operation, non-flaking, non-oxidizing high-temp alloy elements, high-temp insulating refractories backed up by high insulation. Built in various sizes 8x12x10 to 30x36x72 in.



ANNEALING FURNACE—*Waltz-Furnace Co, Dept A, 1901 Symmes St, Cincinnati, Ohio.* Furnace is gas-fired by eight burners with individual mixers. The combustion blower, control valve, gas regulator, and variable-drive mechanism are mounted within the casing. The furnace can be built in any size and either open or controlled atmosphere, full muffler type.

ELECTRIC FURNACE—*Waltz Furnace Co, Dept A, 1901 Symmes St, Cincinnati, Ohio.* Equipped with a mechanical pedal for opening and closing the door, allowing the operator to use both hands for putting material in the oven. Available in ten different models ranging in size from 12 in. wide x 8 in. high x 20 in. long to 28 in. wide x 21 in. high x 48 in. long. Capable of attaining a temperature of 1500 F in 1¼ to 2¼ hr depending upon the furnace size.

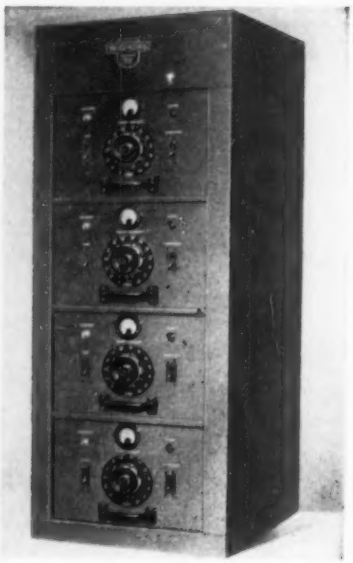


ROLLER-HEARTH FURNACE — *Pereny Equipment Co, 893 Chambers Rd, Columbus 12, Ohio.* Model RH-68 roller-hearth furnace is designed for normal operating temperatures of 1400 F with a 1500 F maximum. Current characteristics are 20 kw, 220 V, 60 cycle, one phase. Chamber size is 15x-30x15 in. high with a roller extension 36 in. long.

QUENCH TANK—*A D Alpine Inc, 11837 Teale St, Culver City, Calif.* This tank maintains a constant level regardless of displacement caused by the work. As the load is lowered into the tank, over-flow runs over a low dividing wall into the reserve section. In this area, a heavy duty pump constantly circulates the liquid back into the main part of the tank, aerating and cooling at the same time. Directional flow can be changed at will.

PORTABLE ELECTRIC FURNACE —*Pereny Equipment Co, Columbus, Ohio.* Heats aluminum bars to 300 F prior to forming. Oven size is 3 ft wide by 6 ft long by 8 in. high; a blower provides recirculation of the heated air. Controls include temp indicator and controller, instrument transformer, magnetic contactor switch box, and motor starter. Power requirements are 36 kw, 440-v, 3 phase.

HEAT-TREATING FURNACE — *Waltz Furnace Co Dept A, 1901 Symmes St, Cincinnati, Ohio.* This furnace has a temp range broad enough to permit the heat treating of all high-speed steels, even the cobalt type. There are actually three furnaces; one with double chambers for 1850 F max temp, a globar-heated furnace with 2400 F max, and a drawing furnace with 1200 F max temp. They are fabricated of 10-gage sheet steel.



INDUCTION HEATER STATIONS —*Induction Heating Corp, 181 Wythe Ave, Brooklyn 11, NY.* Individual induction heating units can be removed and replaced, similar to a drawer of a filing cabinet. Also, the heating stations can be located at any place in the production line. The 2½-kw machine, Model 100S, is available in a number of heavy-gage steel cabinets. Input requirements per section are 4 kva at 220 v, 60 cycles, single phase.

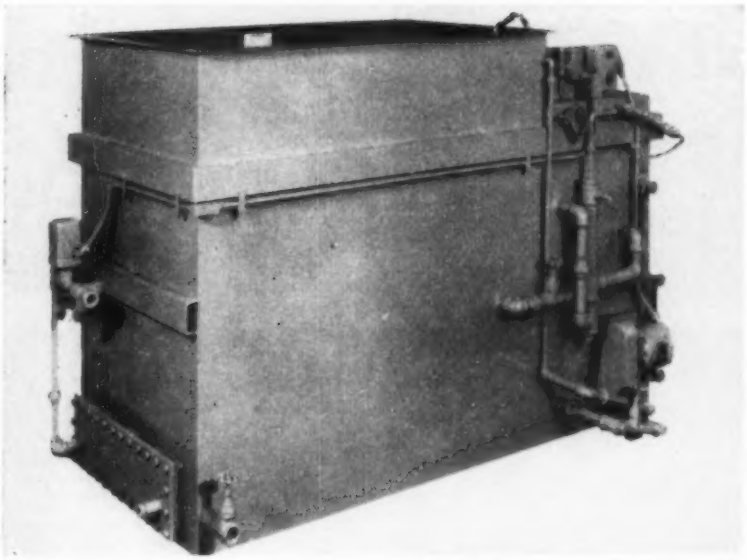
PYROMETER CONTROLLER — *Wheelco Instruments Co, 847 W Harrison St, Chicago 7, Ill.* Called a Capacitrol, this direct-reading pyrometer-controller presents a means of securing temperature control for processing equipment such as ovens, furnaces, kilns, etc.

PYROMETRIC CONTROLLER—*Taco West Corp, 525 N Noble St, Chicago, Ill.* Automatically adjusts the ratio of power on and off over a given time cycle to maintain any desired temperature set with the index pointer.

SURFACE PYROMETER—*Pyrometer Instrument Co, Bergenfield, N J.* Available with a selection of 14 different thermocouples and extension arms to meet every surface and sub-surface temp-measuring need.

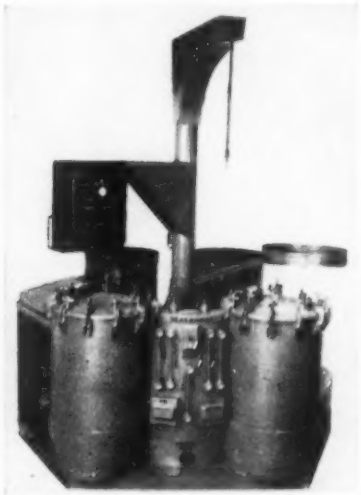
1953
American Machinist
Production Preview

CLEANING AND FINISHING

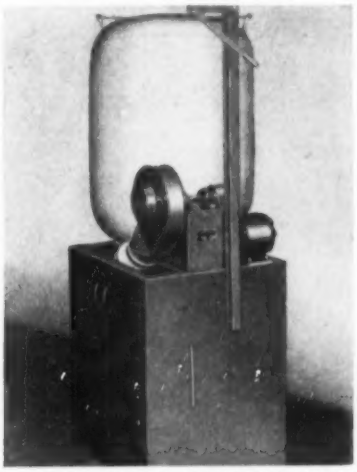


DEGREASER—*Detrex Corp, Detroit 32, Mich.* A minimum of floor space, lower working height, and more efficient solvent condenser are some of the improvements in this hand-operated degreaser. Inside work space is cleared of all projections.

PARTS CLEAN—*Graymills Corp, 3705 Lincoln Ave, Chicago 13, Ill.* Whirling solvent automatically cleans parts placed in a basket or rack within the tank. Basket can be hooked onto the side of the tank to permit drainage.



IMPREGNATING MACHINE—*American Metaseal Corp, 607 65th St, West New York, NJ.* Metaseal 19V5 is a colorless and transparent thermosetting copolymer said to provide permanent sealing of castings that must be pressure-tight. Temperature resistance is —70 to 400 F. Castings are sealed in batch loads in the Metasealing machine.

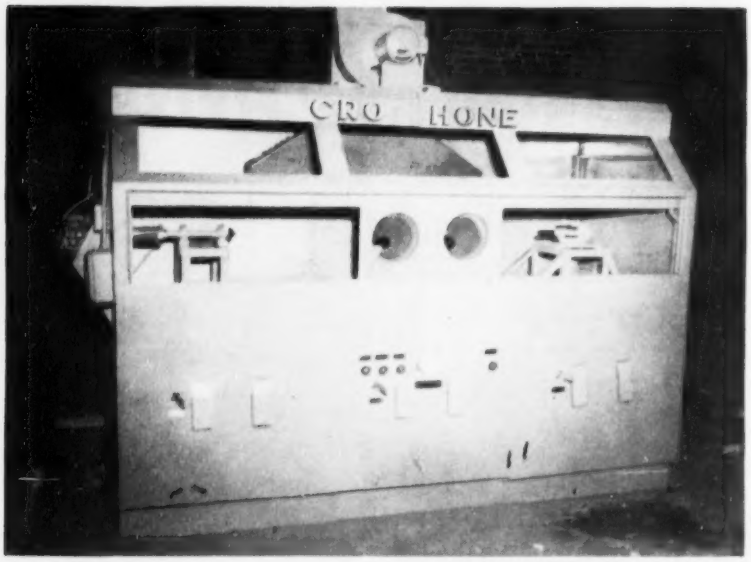


IMPREGNATING MACHINE—*Metallizing Co, of America, 3520 W Carrol Ave, Chicago 24, Ill.* Model M-30 Mogullizer is for the production-line impregnating of castings to eliminate their porosity by sealing under a high vacuum. It will handle leaking and weeping castings, either ferrous or non-ferrous. Weight of the machine is 850 lb and it requires 36x100 in. of floor space. The sealing (vacuum) tank measures 20x30 in.

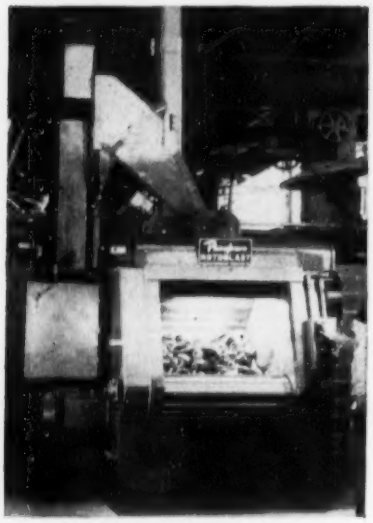
PARTS-CLEANING MACHINE —*Equipment Div, Magnus Chemical Co, Inc, Garwood, N J.* The Aja-Lif is air powered, not air agitated. A flick of the operating lever brings the platform to the top of the tank, out of the liquid, for inspection, loading, and unloading the work. All that is needed is an air compressor. Heating is by gas, steam, or electricity.

VAPOR DEGREASER—*Topper Equipment Co, Matawan, NJ.* Model SC-44 and SC-92 hot vapor degreasers have stainless clad steel wall construction and automatic controls. Solvent reservoirs have built-in water separators and constant solvent level controls. Cleaning rate is 1620 to 2710 pounds of metal parts per hour.

LIQUID HONING—*Vapor Blast Mfg Company, Milwaukee, Wis.* Small complete unit designed especially for toolroom work. Can be operated from either sitting or standing position.—



WET-BLASTING UNIT — *The Cro-Plate Co, Inc, 747 Windsor St, Hartford 5, Conn.* Used on a 5-ft turbine-wheel and shaft assembly of the J35 turbojet aircraft engine. It incorporates a track-mounted dolly for loading the jet assembly into the cabinet. The assembly is rotated on centers through a variable-speed transmission which permits rotation at from 0 to 28 rpm.



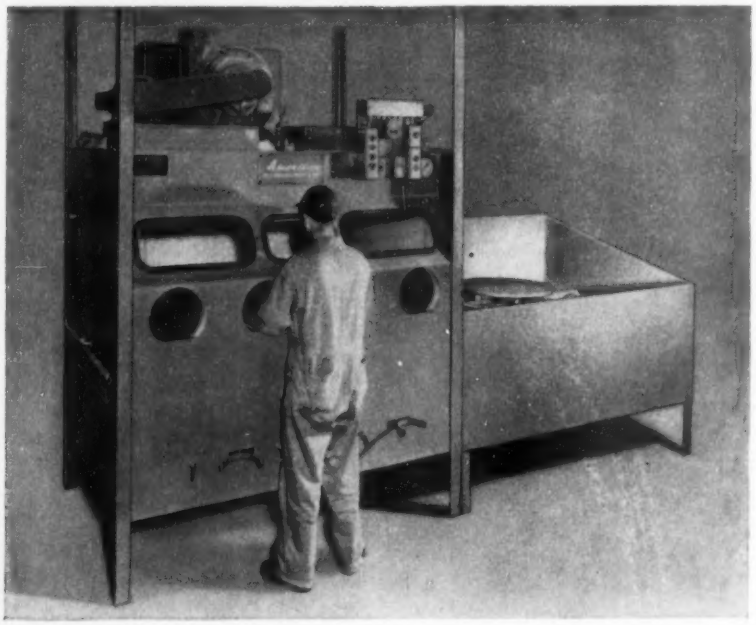
BLASTING MACHINE — *Pangborn Corp, Pangborn Blvd, Hagerstown, Md.* The Type GN barrel has several features aimed at improving cleaning while reducing abrasive losses. Work conveyor is driven by a hardened steel chain and uses special cast ductile iron slats which will not pinch the work. Drive motor for the unit is 1½ hp. The 6-cu-ft unit is 6 ft 8 in. deep by 6 ft wide and 13 ft 9⅞ in. high.

BARREL BURNISHING EMULSION —*Blue Magic Chemical Specialties Co, 2135 Margaret St, Philadelphia 24, Pa.* Called Blue Magic No. 0-221, is said to produce a hand-buffed appearance in metal with any tumbling medium in standard barrel finishing equipment suitable for wet tumbling.

WET-BLASTING ABRASIVES — *American Wheelabrator & Equipment Corp, Mishawaka, Ind.* Range from 80 to 2500 mesh and are packed in 50-lb weights for easy charging. The company will also provide from stock all of the other chemicals needed for wet blasting.

STEEL DEBURRING COMPOUND—*Blue Magic Chemical Specialties Co, 2135 Margaret St, Philadelphia 24, Pa.* The No. S-12 compound is claimed to reduce deburring time by as much as 75 to 90%, and to produce uniform radii on parts such as bearing races and retainers. Generally only ½ to 1 lb per load is required in a 32x30-in. barrel.

CUT-WIRE SHOT—*Park Chemical Co, 8074 Military Ave, Detroit, Mich.* Claimed to be uniform in size and composition, and have up to twenty times the life of cast iron, cast steel, grit, and other materials. Available in sizes of 0.023, 0.028, 0.032, 0.035, 0.041, 0.047, 0.054, and 0.062 in. with tolerances of 0.002 in. Hardness is Rc 45 to 50.



GROUND CORN COBS—*Frank Miller & Sons, 2250 W 58th St, Chicago 36, Ill.* For drying, buffing, tumbling, or polishing is available in three grades; coarse, medium, and fine. Known as Cob-Dri, it is said to be dust-free and uniform in size.

CONDITIONING AGENT — *Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Philadelphia 7, Pa.* Conditioning agent for paint-spray booths is used in the water-circulating system to prevent adhesion of paint to the curtain walls.

BUFFING COMPOUND — *Industrial Washing Machine Corp, Dept E, New Brunswick, N J.* Is removed from polished vacuum-cleaner parts by this machine. Production rate is 900 sq ft per hr. Steam-heated, it washes, rinses, and dries the work automatically.

WET BLASTING—*American Wheelabrator & Equipment Corp, Mishawaka, Ind.* Model 64 Liquamatte is intended for precision cleaning and finishing applications involving large and heavy work. Machine is 6 ft long, 6 ft 10½ in. deep, and 8 ft 11 in. high. It will handle single pieces or loads up to 3500 lb in weight through two 36x49-in. doors.

COATER—*Gasaway Corp, 6465 North Ravenswood Ave, Chicago 26, Ill.* 32-B Rollacoat Finisher, equipped with six accessory material-handling kits, can coat material up to 48 in. in width and 3 in. in thickness at speeds of 30 to 90 fpm; higher or lower speeds are available on special order.

AUTOMATIC HEAD — *Murray-Way Corp, 3925 West Fort St, Detroit, Mich.* Developed for the fast, accurate deburring of turbine-disk slots, but can be converted by a few simple adjustments to a wide range of use. Head may be used with either wheels or buffs and is compact in design.

SEALANT—*Polyplastex International Inc, 441 Madison Ave, New York N Y.* Polyplastex method of sealing castings uses a 100% solid. Upon curing, there is no evaporation to leave a spongy, cellular structure of poor physical properties. The process is based on the use of a specially formulated thermosetting resin. Known as Polyplastex MC, the cured resin can withstand continuous exposures to temperatures up to 350 F.

SHEET COATING—*Mid-America Steel Warehouse, Inc, Chicago, Ill.* Can be used as a primer or finish—in any color desired. It is claimed to be harder and more durable than any other known method of protecting steel against corrosion and heat.

TUMBLER—*Roto-Finish Co, Kalamazoo, Mich.* The DW-30-36-ISF is designed to finish disk circular parts at a low cost. A stationary fixture machine, it uses directional flow of the abrasive to finish parts. It has a single 30¼x35¼-ID rubber-lined compartment with an 18-cu-ft capacity.

CLEANING COMPOUND — *Detrex Corp, Detroit 32, Mich.* Designed for use as a precleaner for steel that is to be deep drawn or extruded. Known as Detrex 61, it is used in a soak tank at 190F at a concentration of from 6 to 10 oz per gal.

TUMBLING BARREL—*Hupp Corp, Globe Div, 1250 W 76th St, Cleveland 2, Ohio.* Flask-shaped tilting tumbling barrel for deburring and burnishing all types of precision parts, both ferrous and non-ferrous. Use of a ¼-in. lining of abrasion-resistant rubber protects parts against nicking and permits barrel to be used interchangeably for deburring and burnishing. Load capacity is 750 lbs.

ELECTRIC TANK HEATER—*Edwin L Wiegand Co, 7577 Thomas Blvd, Pittsburgh 8, Pa.* Has a vapor-tight terminal box. The tubular heating elements are welded to the sealed, electrical connection housing and the wiring is brought out to the terminal box through a thick-walled steel pipe. The units are available in steel, alloy, or stainless with ratings from 3 to 7.5 kw.

WHEEL UNIT BALANCER—*Anderson Bros Mfg Co, 1907 Kishwaukee St, Rockford, Ill.* Called the "Speedi-Balancer" this unit is used in conjunction with polishing, grinding, and buffing lathes. Wheels can be removed and replaced without adding or removing weights. Speedi-Balancers are made to fit arbor size from ⅛ to ⅞ in. and from 1 in. to 1¼ in.

METAL-CLEANING SOLVENT — *Wayne Chemical Products Co, Copeland & MCRR, Detroit 17, Mich.* When mixed in a solution of from ½ to 1% with water at approximately 180 F is claimed to remove all traces of oil and grease from metal parts. It is noncorrosive to aluminum, brass, copper, and most other non-ferrous metals.

DEGREASING SOLVENT—*Curran Corp, Prospect Mills, Lawrence, Mass.* Flow contains diethyleneglycomonethylether. The solvent is said to be relatively odorless, easy to handle, and to dry quickly without leaving any film or sticky residue.

PORTABLE FOG SPRAY NOZZLE—*Bete Fog Nozzle Inc, Greenfield, Mass.* With a carefully controlled spray pattern and volume. Can be used for a variety of industrial uses—cleaning, washing, applying chemicals, and for certain kinds of fire protection.

SOLVENT CLEANER—*Kelite Products, Inc, PO Box 2917 Terminal Annex, Los Angeles 54, Calif.* No. 28 will remove, by spray or immersion, light oil and grease deposits, stamping inks from steel and aluminum, and many other kinds of dirt deposits. It is claimed to be: non-flammable, nontoxic, non-explosive.

REVERSE-CURRENT CONDITIONER—*Oakite Products, Inc, 19 Rector St, New York 6, N Y.* For zinc die castings, removes the surface films, disturbed metal, and last traces of soil prior to plating. It also avoids the hydrogen-gas formations that raise blisters when castings are heated after electroplating.

COLD-SPRAY BONDING SOLUTION —*Du-Lite Chemical Corp, Middletown, Conn.* For product finishes, it can be applied with ordinary spray equipment. It eliminates preparatory steps such as cleaning, rinsing, drying, etc. It is simply sprayed on the product where it dries immediately, ready for application of the final finish.

COMPOUND FOR REMOVING RUST —*Octagon Process Inc, 15 Bank St, Staten Island 1, N Y.* Also forms a phosphate coating which acts as a base for paint. Rustclean-12 is designed for sponge applications to large parts; -15 is used in an immersion process.

RUST INHIBITOR — *Pennsylvania Salt Mfg Co, 1000 Widener Bldg, Philadelphia 7, Pa.* Combines detergent action with rust protection. Steel parts cleaned in the chemical, known as Pennsalt EC-51, are protected from rusting for up to 6 weeks under normal plant conditions.

WET BLASTER — *The Cro-Plate Co, Inc, 747 Windsor St, Hartford 5, Conn.* Pressure-Blast jr. eliminates the usual pump by employing the siphoning action of the compressed-air-operated jet gun. Unit is easily installed requiring only one ⅜-in. water connection, one ⅜-in. air connection (standard shop pressure) and a single 110 v line for blower operation and lighting.

RUST INHIBITOR—*Crown Industrial Products Co, Park and Borden Ave, Sycamore, Ill.* Said to prevent rust for six months to over a year. Can be removed with kerosene or gasoline. It can be applied to a wet damp surface and still be effective—panels coated while damp survive humidity tests longer; it will withstand normal handling—dries to a tacky finish; and is non-toxic and non-flammable.

CLEANING and FINISHING

WATER-SHEDDING COMPOUND—*Enthone, Inc, New Haven, Conn.* Displaces water films from the surface of any metal, facilitating rapid, stain-free drying. Water is repelled from the surface and settles separately to the bottom of the container.

DERUSTING—*Enthone Inc, 442 Elm St, New Haven, Conn.* Alkaline derusting process for steel, cast iron, malleable iron, and other iron alloys does not require acid in the procedure. Attendant advantages are elimination of subsequent rusting, no attack on the base metal, and speed of operation. High carbon steels that are prone to be discolored even in inhibited acids can be rapidly derusted without any trace of tarnish or attack.

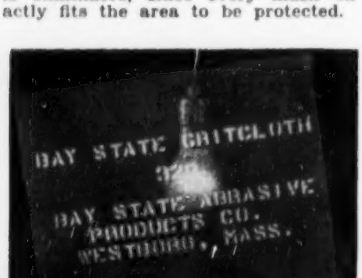
INHIBITOR—*American Wheelabrator & Equipment Corp, Mishawaka, Ind.* Anarust, a liquid rust inhibitor for wet blasting machines, is completely soluble in hard or soft water at 20 C. Effective for retarding rust on cast iron or steel parts being cleaned and washed after wet blasting. Can also be used on parts prior to plating, etc.

CONDITIONER — *Oakite Products, Inc, 124 Rector St, New York 6, NY.* Composition No. 95 is an electrolytic conditioner for zinc base die castings before plating. Reduces rejects because of blistering, produces brighter plating —anodic conditioning removes films; no blackening during anodic cleaning.

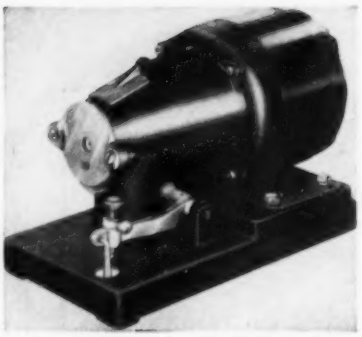
HOMOGENOUS SOLUTION — *Kelite Products, Inc, 1850 N Main St, Los Angeles 12, Calif.* Kelite M-2 has been developed to protect mild steel from corrosion after cleaning. Corrosion-inhibiting properties are said to be superior to petroleum oil; it eliminates need for drying prior to treatment, and is impervious to finger printing. Applicable by immersion, spray, or brush.

ALUMINUM-TINTING PASTE—*Aluminum Co of America, Pittsburgh 19, Pa.* No. 222 is said to give a brighter finish than has been possible thus far with other aluminum pigments. Weight per solid gallon is 12.245 lb., it has a bulking value of 0.0820 gal. per lb.

DIE-CUT MASKS—*By-Buk Co, Dept 26, 431½ W Pico Blvd, Los Angeles 19, Calif.* Pressure—sensitive paper mask provides fast and accurate masking for production-line spray or brush painting and sand-blasting. Over-masking down the sides or over the surfaces is eliminated, since every mask exactly fits the area to be protected.



OPEN-MESH SANDPAPER — *Bay State Abrasive Products Co, Westboro, Mass.* Gritcloth has no solid backing of paper or cloth—thus removed stock flows through the open mesh and does not clog the abrasive. It is claimed to last 10 to 15 times longer than ordinary sandpaper.



WIRE STRIPPER—*High Speed Hammer Co, Inc, Rochester, N Y.* High-speed wire stripper has special alloy-steel circular cutting knives which completely remove insulation from solid, stranded, or multi-conductor cable up to ½-in. dia. Stripping length is adjustable up to 1½ in. Its ¼-hp 110-v direct-connected motor comes complete with cord, switch and plug ready for any convenient outlet.

PAINT & LACQUER HEATER—*Arvins Viscolator Corp, 123 DeKalb Ave, Brooklyn, N Y.* Viscolator is designed to reduce the viscosity of lacquer, synthetic enamels, and similar materials. Heated by electricity, steam, or a combination of both. Available in circulating and non-circulating types in capacities of 12 to 250 gph.

BLACK UNIVERSAL PRIMER — *United Lacquer Mfg Corp, 1001 W Elizabeth Ave, Linden, NJ.* Can cling to polished chrome and stainless steel. Made with a vinyl-plastic base, it is claimed to be so flexible that parts can be formed, extruded, or blanked after finishing.

JET BLACK FINISH — *Parker Rust Proof Co, Detroit 11, Mich.* For iron and steel, said to have ten times the corrosion resistance of conventional blacks; available under the tradename Parco Black. Parts to be treated are immersed for 15 to 30 minutes in the processing bath, rinsed, and dried. After oiling or waxing, finish is ready for service. Product is suitable for machined or threaded parts.

PAINT—*The Monroe Co, 10703 Quebec Ave, Cleveland 6, Ohio.* Rust-Cure paints for metal surfaces are now available in red, gray, and green, as well as black, aluminum, and clear. Can be applied by brush or spray directly over rusted surfaces without wire brushing or sandblasting. One coat primes, penetrtates, and seals all metal surfaces.

ALUMINUM PAINT—*Speco Inc, 7308 Associate Ave, Cleveland 9, Ohio.* Heat-Rem H-170 fuzes with the metal on which it is applied. The paint will withstand long exposure to temperatures up to 1700F with repeated chilling and reheating. The paint will air dry in 30 minutes. Hard drying, however, will not be achieved until heat is applied.

RUST-PROOF TREATMENT—*Octagon Process Inc, 15 Bank St, Staten Island 1, N Y.* Chemical treatment known as Rust-shield 2 uses a phosphatizing compound which changes steel and iron surfaces to rustproof, highly-absorbent non-metallic areas. Because of chemical action between the phosphate and the metal surface, the coating has great adherence. Metal parts so treated will retain lubricating oils longer than smooth steel surfaces.

COLD-GALVANIZING COMPOUND—*Galvanite Corp, 40 W 29th St, N Y. 1, N Y.* Despite lower cost, is claimed to outperform or equal electroplating, hot dipping, cementation, spraying, and painting. Known as Galvanite, a single coating at brushing consistency will cover 625 sq ft per gal.

ALUMINUM ETCHING COMPOUND —*Oakite Products, Inc, 19 Rector St, New York 6, N Y.* No. 60 gives a velvet-like appearance to the surface. It does not scale—a light, soft sludge is formed which can be easily removed with a stream of water. Powder should be used in concentrations of 2 to 6 oz/gal, between 140 and 180 F.

COLOR DYEING—*Enthone, Inc, New Haven, Conn.* In one operation, protection and coloring of aluminum in such colors as yellow, blue, green, gold, and brass. Procedure consists of cleaning the aluminum part and immersing it in a solution of Alumox 44 salts. Dyes can be added to the solution so that coating and dyeing occurs simultaneously.

ELECTRIC PAINT REMOVER—*General Electric Co, Schenectady 5, NY.* Using radiant heat, consists of two skids under which is mounted a GE Calrod tubular heater rated at 1000w, 115 v. When device is slid along a painted surface, heat causes the paint to soften and blister; it can then be removed with a putty knife. Unit, which weighs 2¼ lb, retails for $14.95.

PAINT STRIPPER—*Oakite Products, Inc, 19 Rector St, New York 6, N Y.* R-6 is a gray, dustless granular material that is completely soluble in water. Solutions of R-6 are highly alkaline in nature. For removing oil-base paints, certain types of lacquers, synthetic finishes, grease, and caked-on oil concentration of 6 to 16 oz/gal. is recommended at temperatures from 180 to 210 F.

VINYL COATING FOR PAINT-SPRAY BOOTH—*Detrex Corp, Detroit 32, Mich.* It dries rapidly and forms a tough plastic film with extra-high tensile strength. A gallon will cover from 275 to 400 sq ft depending upon thickness.

RUST-PREVENTIVE PAINT—*United Laboratories, Inc, Cleveland 12, Ohio.* Is said to dry in 10 min under normal drying conditions with one coat providing excellent hiding of the old metal surface. It will withstand temperatures from –100 F to + 250 F and is resistant to salt air and fumes.

FYI

FOR YOUR INFORMATION

FREE Catalogs, Booklets, Charts, Calculators

FYI—these initials symbolize information that's important. And there is much of importance in the literature listed here. To get the ones you need, all you do is fill out one coupon for each booklet you wish to order. Indicate in the circle on the coupon the number of one catalog wanted. When you have filled out a card, detach, stamp, and mail. We'll do the rest.

MACHINES AND ATTACHMENTS

1 BENDING ROLLS — *Niagara Machine & Tool Works, Buffalo, NY.* 4-page bulletin 38-A illustrates new 6- to 8-in. series. Three pinch rolls produce true cylinders from thinnest sheets to max capacity of roll.

2 THREAD GRINDER — *Ex-Cell-O Corp, Detroit, Mich.* 6-page bulletin 48824 contains specifications of model 36 large-capacity unit. Extra equipment, including dressers, is listed and described.

3 SHELL LATHE—*Wm K Stamets Co, Pittsburgh, Pa.* 4-page bulletin 100-D describes base-facing and cutoff, rough turning, and finish turning. Table of specifications included.

4 PRESS ROOM EQUIPMENT—*Durant Tool Supply Co, Providence, RI.* 12-page illustrated catalog describes extensive line, including new indexer, coil cradles, and stock straighteners. Specifications and applications included.

5 CONCENTRIC GRINDER — *Landis Tool Co, Waynesboro, Pa.* 4-page illustrated bulletin CX-42 describes 4-in. unit featuring new workholding method and automatic loader. Standard and optional equipment listed, plus condensed specifications.

6 OPEN-BACK PRESS—*Federal Press Co, Elkhart, Ind.* 20-page catalog contains detailed information on line of inclinable units including standard, dial feed, high speed, and special presses in 6- to 90-ton capacities.

7 CHASER SHARPENING MACHINE — *Jones & Lamson Machine Co, Springfield, Vt.* 8-page illustrated catalog 503 provides data on universal bench-type unit. Operational information included.

8 METALWORKING MACHINES — *O'Neil-Irwin Mfg Co, Lake City, Minn.* 32-page catalog contains illustrated information on Di-Acro units for forming, cutting, and punching operations. Specifications and capacities in tabular form. Case histories of applications included.

9 SURFACE GRINDER—*Mattison Machine Works, Rockford, Ill.* 21-page catalog illustrates variety of applications for high-powered precision unit in table sizes from 12x36 in. up to 36x192 in. and larger.

TOOLS AND ACCESSORIES

10 MARKING TOOLS—*M E Cunningham Co, Pittsburgh, Pa.* 32-page catalog 100 describes and illustrates over 100 different tools and devices. Includes stamps, marking machines and fixtures, dies and die inserts, etc.

11 THREAD GAGES—*Detroit Tap & Tool Co, Detroit, Mich.* 20-page bulletin SG-52 lists prices of thread plug, thread ring, and thread setting plug gages for machine screw and fractional sizes. Tolerance tables and ordering information included.

12 TAPS—*DoAll Co, Des Plaines, Ill.* 16-page bulletin 51-818 illustrates and describes line including hand, machine screw, nut, pulley, pipe, tapper, and hook taps. Charts giving drill sizes for various thread dimensions provided.

13 LUBRICATORS—*Hills-McCanna Co, Chicago, Ill.* 16-page illustrated catalog describes open and enclosed force feed units available in capacities from 2 to 32 pt with 1 to 24 feeds per unit.

14 AIR POWER—*Mead Specialties Co, Chicago, Ill.* 56-page 1953 edition of catalog pictures and describes entire line including single- and double-acting air cylinders, and air-operated presses, vises, chucks, valves, hammers, work feeders.

15 CUTTERS—*Onsrud Cutter Mfg Co, Libertyville, Ill.* 20-page illustrated catalog covers complete line of routing and milling cutters for non-ferrous metals, including wide range of units for extremely high speeds. Applications, sizes, and prices listed.

16 CUTTING TOOLS—*Threadwell Tap & Die Co, Greenfield, Mass.* 48-page illustrated catalog provides data on complete line, including taps, dies, twist drills, counterbores, keyway broaches, and tap and die kits. 48-page fixed gage catalog also available.

17 TWIST DRILLS — *DoAll Co, Des Plaines, Ill.* 16-page illustrated catalog 51-816 covers wide variety of styles in fractional, letter, and wire sizes. Lists drill sets, countersinks, etc. Instructions for drill pointing and web thinning included.

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FOR YOUR INFORMATION

18 CUTTERS—*M A Ford Mfg Co, Davenport, Iowa.* Catalog illustrates and gives specifications on 343 shapes and sizes of high speed steel rotary files, ground cutters, countersinks, reams, carbide cutters, end mills, and grinding burs. Charts included.

HEAT-TREATING AND WELDING

19 FLAME CUTTING—*National Welding Equipment Co, San Francisco, Calif.* 20-page brochure contains extensive data on process; provides information on selection of fuel gas, cutting tips and torches.

20 TEMPERATURE RECORDER—*The Foxboro Co, Foxboro, Mass.* 20-page bulletin 447 contains construction details, and information on selection and use of instruments. Includes charts, diagrams, and installation data.

21 TOOL & DIE SALVAGE WELDING — *Eutectic Welding Alloys Corp, Flushing, NY.* 64-page illustrated manual contains extensive information on procedures, particularly as related to heavy-duty press dies.

PLANT-SERVICE EQUIPMENT

22 FLEXIBLE CORD—*Whitney Blake Co, New Haven, Conn.* 24-page illustrated bulletin includes all classifications, plus data on Dynaprene and rubber-jacketed cords, and braid-covered types. Selection and ordering information provided.

23 PURIFIERS — *V D Anderson Co, Cleveland, Ohio.* 8-page illustrated folder contains detailed data on line type HIEF units. Installation photos, selection tables, dimensions, capacities, and prices included.

24 VERTICAL PUMP—*Allis-Chalmers Mfg Co, Milwaukee, Wis.* 8-page illustrated bulletin 52B6075A on small units for sidewall or submerged mounting. Tables and construction details provided.

25 ROTARY SHELVING — *Frick-Gallagher Mfg Co, Wellston, Ohio.* 16-page catalog describes Rotabin rotary shelving to store parts, tools, and materials. Design and construction features, and variety of accessories included.

26 DAMPERS — *Minneapolis-Honeywell Regulator Co, Brown Instruments Div, Philadelphia, Pa.* 11-page bulletin 2502 describes line, including electric, pneumatic, and manual operators. Application data, charts, and damper ratings included.

27 HYDRAULIC POWER UNITS — *Vickers Inc, Detroit, Mich.* 4-page illustrated bulletin 52-45 describes units featuring hydrogen-brazed sandwich-panel construction which eliminates manifold piping to save space and simplify installation and maintenance.

28 CONVEYOR TERMS AND DEFINITIONS—*Conveyor Equipment Manufacturers Association, Washington, DC.* 64-page manual on standard nomenclature for types and parts contains 1500 listings and line drawings of 80 types and parts.

PARTS AND MATERIALS

29 COMPOSITE METALS — *Metals & Controls Corp, General Plate Div, Attleboro, Mass.* 12-page illustrated catalog describes various composite and precious metals, electrical contacts, and Truflex metals. Two sections cover thin gage and mirror finish rolling.

30 UNIVERSAL JOINTS — *Apex Machine & Tool Co, Dayton, Ohio.* 24-page illustrated booklet 27 provides information on complete line. Removable application data sheets provide easy means of indicating specific requirements.

31 SLIDE RULE CALCULATOR—*Dayton Rogers Mfg Co, Minneapolis, Minn.* Weight calculator for all flat sheet material. May be obtained free by requesting on company letterhead.

32 SWITCHES—*Minneapolis-Honeywell Regulator Co, Micro Div, Freeport, Ill.* 24-page catalog 82 covers safety, limit and interlock switches for ac circuits. Dimensions, characteristics, capacities and applications included.

33 ALLOY STEEL—*Peter A Frasse & Co, New York.* Available chart shows chemical analysis for each of 70 military and federal specifications. Also listed are specified forms and nearest corresponding SAE, AISI, and AMS type numbers.

34 MECHANITE CASTINGS—*Mechanite Metal Corp, New Rochelle, NY.* 32-page booklet contains 43 illustrations of applications and complete tables of physical properties of types of materials available.

35 PACKINGS—*Greene, Tweed & Co, North Wales, Pa.* 20-page catalog PC-102 provides detailed information on Palmetto packings. Applications, diagrams and packing dimensions included.

36 SPEED REDUCERS — *D O James Gear Mfg Co, Chicago, Ill.* 32-page catalog 47-B contains extensive data on motorized gear speed reducers, motor reducers, and gear speed reducers. Available in 35 sizes in ranges from ¾ to 75 hp.

37 STEEL TUBING—*Pacific Tube Co, Los Angeles, Calif.* 8-page bulletin 15 contains detailed information on Paton tubing and cold finished rods and bars. Table lists average physical properties.

38 CARBIDE ALLOYS—*Allegheny Ludlum Steel Corp, Pittsburgh, Pa.* 32-page brochure covers production techniques and applications. Available blanks, tools, die sections, punches and drawing die inserts listed, together with suggested methods for use.

39 TACHOMETER — *The Bristol Co, Waterbury, Conn.* 20-page illustrated bulletin B1402 describes full line of recording and indicating electric instruments, including new electronic unit. Engineering information on magnetos and magneto drives included.

40 CORROSION-RESISTANT LININGS —*US Stoneware Co, New York.* 12-page bulletin TL-526 illustrates and describes composition and properties of Tygon lining and covering material. Variety of applications included.

41 VOLTAGE STABILIZERS—*General Electric Co, Schenectady, NY.* 12-page booklet GEA-5754 provides data on automatic units from 15 to 5000 v-a. Describes causes and effects of voltage variations, and lists applications.

42 SCREW CALCULATOR — *Standard Pressed Steel Co, Jenkintown, Pa.* Calculator enables all dimensions to be quickly obtained for a standard screw of given dia. Threads per in., and proper tap drill size in NC and NF, and body drill and counterbore sizes are given for each dia.

MISCELLANEOUS

43 TURBINE-GENERATORS — *Westinghouse Electric Corp, Pittsburgh 30, Pa.* 20-page booklet B-5418 illustrates 30 applications and describes six principal types of industrial turbines. Photographs and installation data included.

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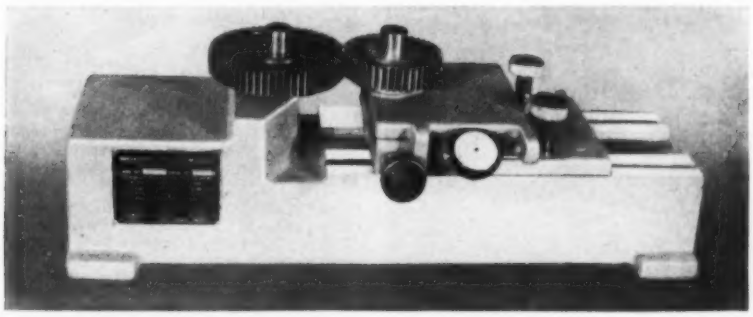
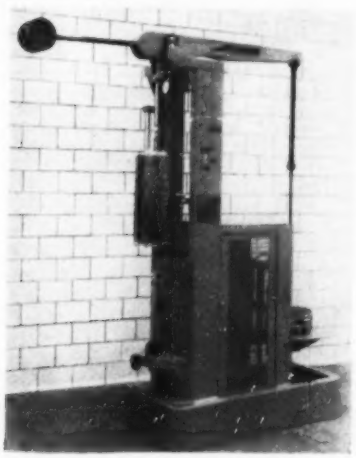
1953 American Machinist Production Preview

LAYOUT AND INSPECTION

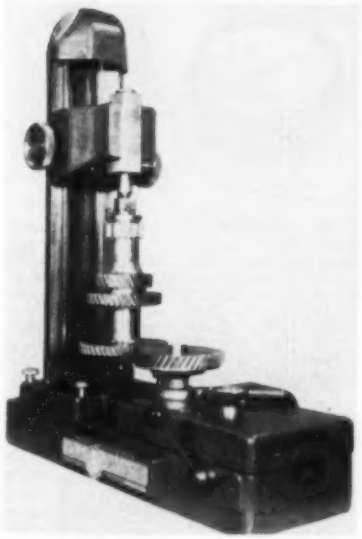


GEAR INSPECTION—*Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Model 602 and 702 bench-type rolling fixtures check size, eccentricity, and roll smoothness of external and internal gears respectively. Model 602 has a center distance adjustable from 2 to 10 in. for checking spur and helical external gears. Model 702 for checking internal gears is made in three sizes: 702-A for gears up to 4-in. OD, 702-B up to 7-in. OD, and 702-C for gears up to 12-in. OD.

HOB CHECKER—*Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* In addition to inspecting leads on hobs and worms, Model 876 will check flute and thread spacing on multiple-thread hobs. Hob capacity, ¼ to 8 in. dia; Max. spread of center, 13 in; lead capacity, (right or left), .0 to 7.2 in.



LEVER-ARM CREEP TESTER—*Arcweld Mfg Co, 140 46th St, Pittsburgh 1, Pa.* One of the features of this machine is the power-operated lifting mechanism for the weights needed to load specimens. For testing at temperatures up to 1800 F an extra-large furnace with three heating zones is provided. Elongation of specimens may be observed on a dial gage that is mounted on the upper extension grip.

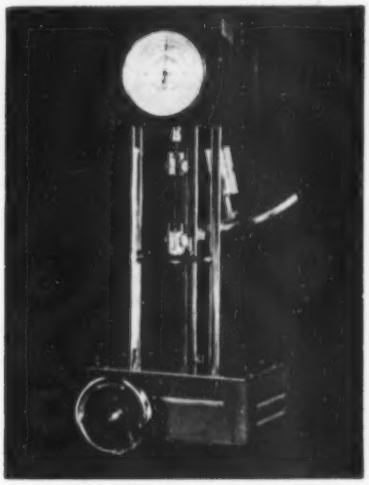


GEAR-ROLLING FIXTURE—*National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* When the work gear is rolled in mesh with the master gear, the errors indicated are read directly on a dial indicator actuated by any movement of the master gear slide.

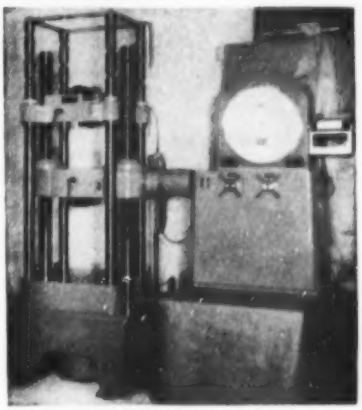
METAL SLICER—*William J Hacker & Co, 82 Beaver St, New York 5, N Y.* Cuts sections only a few microns thick by means of a special knife and holder. The microstructure can then be examined under incident light without previous grinding. The only treatment needed is a short polishing and the usual acid etch. Imported from Germany.

PRESS TESTER—*The Denison Engineering Co, Columbus, Ohio.* Rocket motor body is exposed to a pressure of 25,000 psi for a full two seconds, and the test is conducted at the rate of 600 per hour. This is approximately six times faster than previous methods with a great saving in manpower required to operate the equipment.

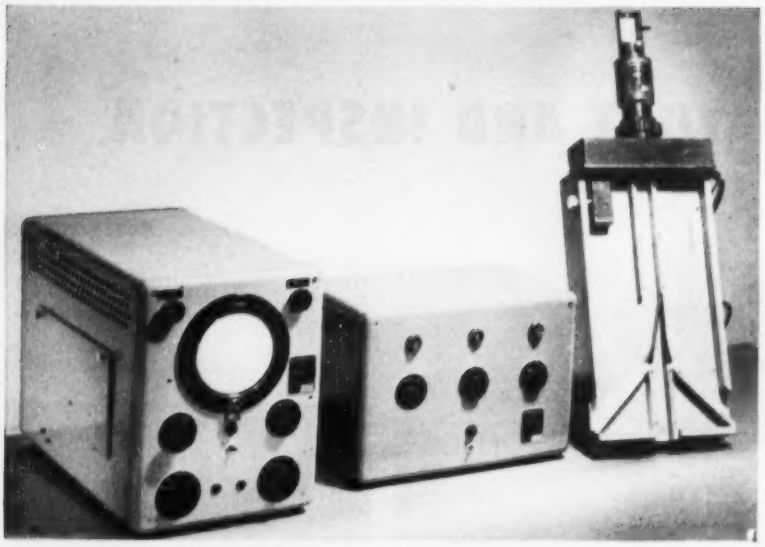
HARDNESS TESTING INSTRUMENT — *Peabody Industries, 12129 Hamilton Ave, Detroit 3, Mich.* This pocket-size surface-hardness testing instrument for use on nonferrous material, weighs less than 5 oz and is under 5 in. in length. Direct reading scales.



LOW-RANGE TESTER—*W C Dillon & Co, Inc, 1421 S Circle Ave, Forest Park, Ill.* Multi-low range testing machine, designed for applications where the load must be applied at slow speed and can be stopped instantly. Grip clearances are 14¾, 24, 36, and 48 in. Four individual scales are 10 lb. range with ½ lb. divisions, and 100 lb. range with 5 lb. divisions.



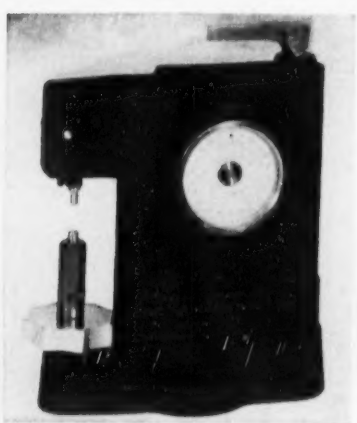
UNIVERSAL TESTER—*Tinius Olsen Testing Machine Co, Easton Road, Willow Grove, Pa.* The DeLuxe Super-L hydraulic universal testing machine is a universal capable of handling larger specimens with the same accuracy. Built in capacities of 60,000, 120,000, 200,000, 300,000, 400,000, 500,000 and 600,000 lb.



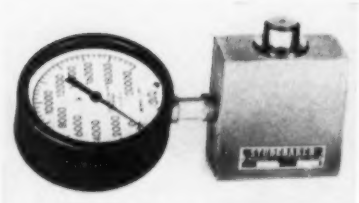
TEST INSTRUMENTS — *Magnaflux Corp, 5900 Northwest Highway, Chicago 31, Ill.* Range of electronic test instruments which operate by inductive pick-ups or coils to test for size, defects, material conductivity, to segregate between alloys, and a number of other sorting or classifying functions.

MAGNAFLUX UNITS — *Magnaflux Corp, Chicago 31, Ill.* New units are larger than the old ones, comparable in price, and with a greater capacity to 96 in. The units now can handle a greater diversity of parts for inspection. They are built for either 220 or 440 volts 60 cycle, interchangeably. AC units are primarily for surface defects.

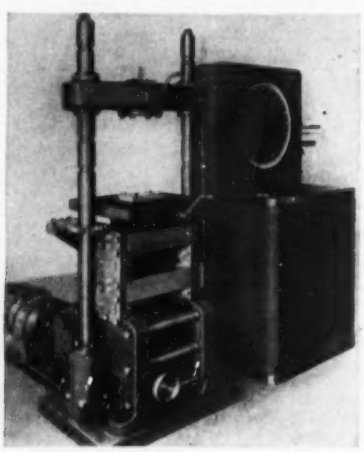
ELECTRICAL TESTER—*Ideal Industries, Inc, 1057 Park Ave, Sycamore, Ill.* Test-Glo can be used for checking electric circuits, spark plugs, motors, fuses, and a variety of electrical equipment. Capacity includes voltages from 80 to 600, ac or dc.



HARDNESS TESTER—*J P Newman Co, 821 S Raymond Ave, Alhambra, Calif.* Features of this 3-in. capacity hardness tester include addition of the A and D scales to the current C-B and E scales. Operator is enabled to test very thin sheet steel; with the C scale, major load is too great for thin stock.

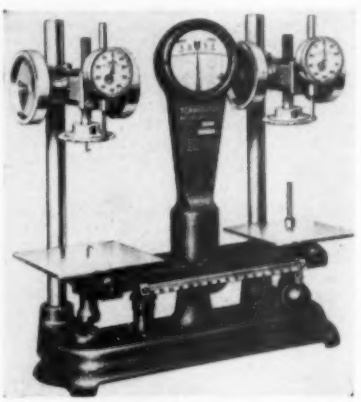


RAM PRESSURE TESTER—*Studebaker Machinery Co, 1176 S 9th Ave, Maywood, Ill.* Will directly and accurately indicate actual ram pressure on press work. Can be used on all types of presses, in either a vertical or horizontal position. Self-contained hydraulic unit accurately calibrated. Made in three sizes, 0 to 10,000 lb; 0 to 50,000 lb; 0 to 100,000 lb.

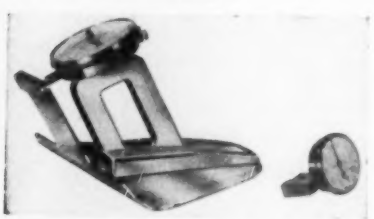


TESTING MACHINE—*Baldwin-Lima-Hamilton Corp, Philadelphia 42, Pa.* This 50,000-lb capacity universal testing weighing system and an electronically-controlled, motor-driven loading mechanism. Loads are measured by means of two SR-4 universal load cells at the base of the two vertical tie rods.

COMPRESSION TESTER — *Labquip Corp, 4520 W North Ave, Chicago 39, Ill.* This lightweight portable hydraulic compression machine is said to be the ideal testing apparatus for many types of small parts, including metal, ceramic, and plastic. Standard model has a capacity of 350 lb under an operating air pressure of 100 psi.



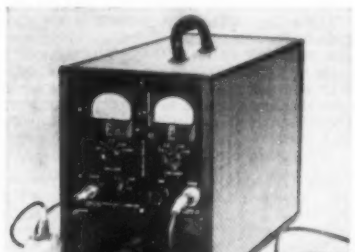
TESTING MACHINE — *Torrington Manufacturing Co, Torrington, Conn.* Spring-testing machine is essentially an even-balanced weighing scale mounted on a base, with a sponge-rubber pad underneath. Smaller model has a capacity of 3 lb. The larger model measures loads to the nearest fifth of an ounce to 16 pounds.



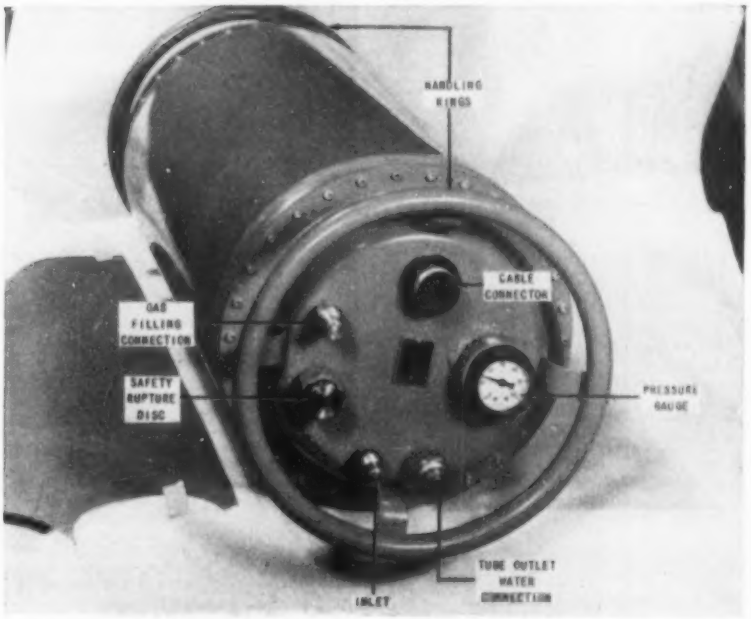
SHEET-METAL TESTER—*Steel City Testing Machines, Inc, 8843 Livernois Ave, Detroit 4, Mich.* The Model B-1 Flex-Tester performs a non-destructive test on sheet metal to determine its comparative drawing qualities, and its stretch-strain characteristics. The tester bends a corner of a sheet through a standard arc, measuring on a dial indicator the resistance of the steel to the operation.

THICKNESS TESTING—*Branson Instruments, Inc, 430 Fairfield Ave, Stamford, Conn.* Measurements by the ultrasonic Audigage thickness tester can be made more speedy and convenient by the use of a magnetic fixture to hold the searching unit against the plate being tested. This accessory assures good contact and prevents accidental shifting of the searching unit. The standard fixture is 5 in. wide and weighs 6 oz.

HUMIDITY TESTING CABINET — *Murphy & Miller, 1326 S Michigan Ave, Chicago, Ill.* 27-cu-ft working area will supply relative humidity between 20 and 95% in the temp range of 35 to 185 F. Fast, accurate regulation is assured through the use of a hermetically-sealed refrigeration unit and an electric heating system, which quickly lower or raise interior temp to the precise degree required.



BALANCING MACHINE — *International Research & Development Corp, 908 West Third Ave, Columbus 8, Ohio.* Model 652 Vibration is a portable electronic machine for the analysis, evaluation, and correction of vibration. Integrated with a test stand for dynamic balancing of rotating parts in the range from 600 to 40,000 rpm, or as a final production step in balancing complete machines. Meter readings can be obtained in full scale from 0.0001 to 0.1 in. peak to peak.



ELECTRONIC RECORDER — *Tinius Olsen Testing Machine Co, Easton Road, Willow Grove, Pa.* The Model 51 electronic recorder produces stress-strain curves in tension, compression, and transverse testing. It automatically follows increasing and decreasing stresses and strains. It can be used on all types of testing machines and is available in metric units.

BALANCING MACHINE—*R B Annis Co, 1101 N Delaware Street, Indianapolis 2, Ind.* Balancing and runout checking machine for round rotors and blower wheels ranging in size from 3 to 11 in dia with a maximum face width of 7 in. It has a bed length of 50 in. and is equipped with a standard headstock and photoelectric scanning arrangement for phase indication.

ELECTRONIC SORTING GAGE — *Federal Products Corp, 1144 Eddy St, Providence 1, RI.* Automatic instruments, hopper fed with automatic disposal unit designed to measure the OD of six different sizes of roller bearings. The workpieces are sorted into six "good" classifications, each equal to 0.001 in., plus oversize and undersize. Gaging speed is 20,000 bearings per hr.

X-RAY UNIT—*General Electric, 4855 Electric Ave, Milwaukee 14, Wis.* This 250,000-v X-ray machine, capable of operation on steel up to 3½ in. in thickness, is less then 15 in. in dia, and measures 44 in. in length. It weighs 150 lb, as against 1150 for conventional units. Protruding snout from which rays are emitted facilitates taking of interior X-ray pictures. Can be used on anything from magnesium to steel.

X-RAY CABINET—*Bar-Ray Products, Inc, 209 25th St, Brooklyn, N Y.* For either radiographic or fluoroscopic inspection of parts. It is designed for straight-line or rotary operation. The cabinet is lead-lined metal construction with pneumatically operated lead-lined sliding doors.

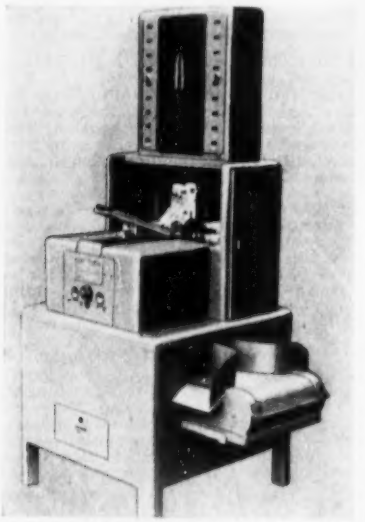
PORTABLE X-RAY UNIT — *Holger Andreasen, Inc, 703 Market St, San Francisco, Calif.* Fedrex portable X-ray unit is now being imported under the name Andrex. The unit can be carried by one man into working spaces normally inaccessible. Available in capacities of 125 and 175 kvp.

NOISE-LEVEL MEASUREMENTS — *General Radio Co, 275 Massachusetts Ave, Cambridge 39, Mass.* Is smaller, lighter, easier to use, and lower in cost than standard sound-level meters. The total sound-pressure-level range is from 40 to 136 decibels and three frequency weighting networks are provided.

TEST CHAMBER—*Tenney Engineering, Inc, 26 Ave B, Newark 5, NJ.* Five basic types of temp-humidity test chambers available automatically maintain humidity from 20% to 95% through a temp range of 35 F to 185 F. Minimum dew point is 33 F. Inside dimensions of the TH series range from 22x19x48 in. to 48x24x48 in.

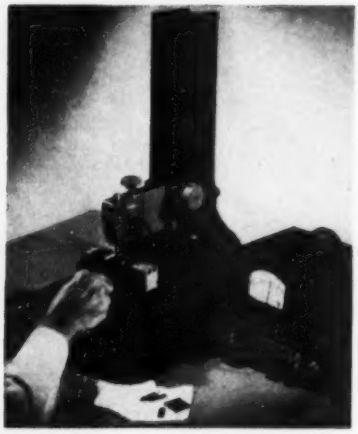
TEST STAND—*U S Electrical Motors Inc, 200 E Slauson Ave, Los Angeles 54, Calif.* The operating characteristics of parts such as aircraft generators, vacuum pumps, hydraulic pumps, and compressors can be determined by this test stand. The dual head permits a wider variation in takeoff speeds than a single head and also allows two parts to be tested at a time.

GAGE CHECKER—*The DoAll Co, 254 N Laurel Ave, Des Plaines, Ill.* Unit is 37-in. high, 28 in. wide, and 18 in. deep. It is constructed of heavy-gage welded steel and has a pressed-wood top with a ledge around it to prevent tools and gages from sliding off to the floor. The five doors are roller-mounted and locked with a single lock on the top door.



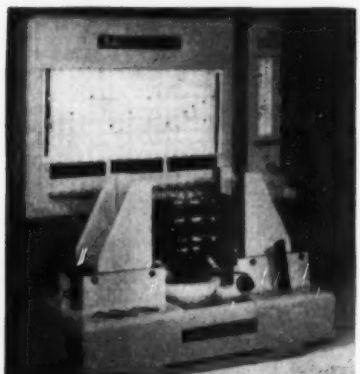
AUTOMATIC INSPECTION — *Cosa Corp, 405 Lexington Ave, New York 17, NY.* The Sigma fully automatic inspection, sorting and tabulating machine was designed to inspect any part for internal or external direct dimensions. Parts are fed into the machine automatically, where they are inspected on all dimensions simultaneously.

LAMP INSPECTION — *Ultra-Violet Products, Inc, South Pasadena, Calif.* Blak-Ray model 40 is an ultra-violet device for industrial fluorescent inspection, processing, and packing operations. It covers an area of 20 to 40 sq ft with long wave radiation. Three 40-w tubes used are rated at 3000 hrs.

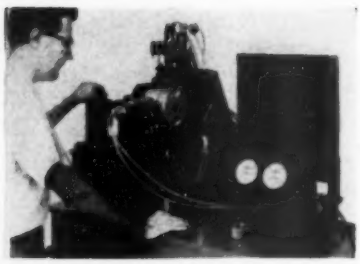


ELECTRONIC MICROCOMPARATOR—*Graham-Mintel Instrument Co, 735 Carnegie Ave, Cleveland 15, Ohio.* Micro-Ac comparator consists of (1) induction gage head adjustably mounted on a rigid stand, (2) high-stability 4-tube amplifier with 2-scale meter. Gage head has frictionless movement, with no mechanical amplification.

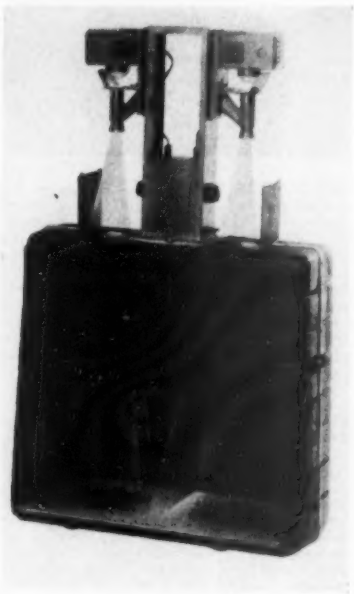
AIR GAGE—*The Taft-Peirce Mfg Co, Woonsocket, RI.* Comp-airator utilizes the flow-metering principle of measurement; lending itself well to small gaging members and consequently to small-hole gaging.



GAGE—*Sheffield Corp, Dayton 1, Ohio.* Jet-engine-blade contour gage checks 18 to 26 or more points simultaneously. It can be adjusted for use with either the widest or narrowest tolerances specified in any plant at any phase of manufacturing jet blades.



ID, OD PISTON GAGE — *Federal Products Corp, 1144 Eddy St, Providence 1, RI.* Multi-dimension gage measures all critical dias of automotive and aircraft pistons in two operations. Slightest variation is immediately noted by the Dual Dimensionair.

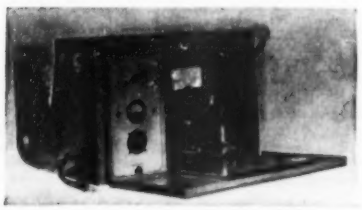


SURFACE COMPARISON — *The Brush Development Co, 3405 Perkins Ave, Cleveland 14, Ohio.* The Faxfilm surface comparator consists of a portable comparison projection unit with a removable work case. Thirty diameter magnification is provided by Wollensack 1-in. focus F/1.9 projection lenses.

TEST CHAMBER—*Industrial Freezer Div, Webber Appliance Co, Inc, 2740 Madison Ave, Indianapolis 3, Ind.* For production line and experimental testing combines high and low temperature and humidity. The unit, which has a temperature range from +250 F to —100 F, can be cycled from ambient to —100 F in 45 min., and from —100 F to +20 F in 30 min.

ABRASION TESTER—*Taber Instrument Corp, 111-AM Goundry St, North Tonawanda, N Y.* Used for rating the wear resistance of protective finishes, i.e., black oxidized or electroplated coatings, extruded plastic and enamel applied to aircraft, ordnance and metal tubing, and other cylindrical parts. The abrasion resistance is reported as the number of wear cycles the surface will withstand before penetration of the finish permits corrosion.

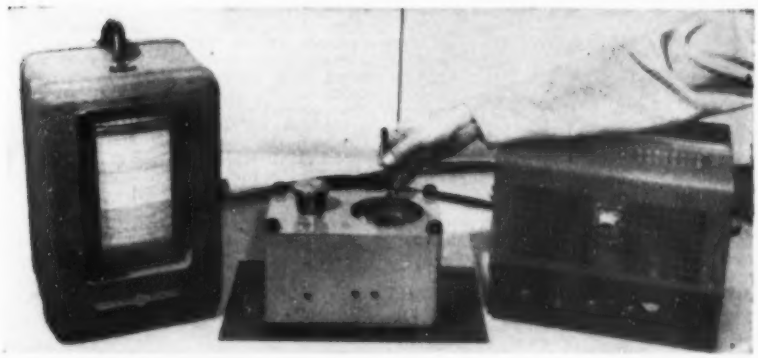
BALL GAGING — *Colonial Arts, 315 Fountain Square Theatre Bldg, Indianapolis, Ind.* This machine gages and sorts precision ball bearings at the rate of 2600 units per hour. It will sort into oversize and undersize, also ten categories of ten millionths. The Model A is designed to sort balls ranging in size from 1/32 to 7/32 in. in diameter.

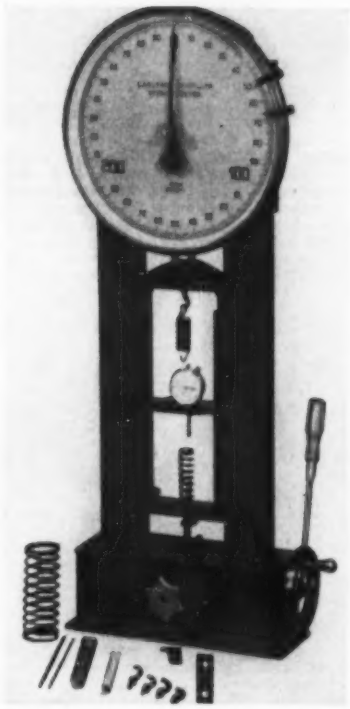


CLEANING INDICATOR—*Weltronic Co, 19500 W Eight Mile Rd, Detroit 19, Mich.* Device measures surface electrical resistance, directly in microhms, as a criterion of the effectiveness of a cleaning process. Aluminum other materials with low surface resistance may be measured. Resistance values of 0 to 100 microhms can be read directly off a linear scale and 100 to 1000 microhms may be read indirectly.

SPACE OSCILLATOR — *Buck Engrg Co, Freehold, NJ.* Designed to excite one, two, or three directional mechanical vibrations, for fatigue testing of specimens or structural members, and for determining dynamic characteristics of other materials. Rated capacity of 2000 lbs at 15 cycles per second, and 1000 lb at 60. Complete frequency range is 3½ to 60 cycles per second.

CONCENTRICITY INSPECTION — *J F Shadgen, 58-20 Burns St, Forest Hills, NY.* For making concentricity inspection of shell, rockets, and projectiles, a drive and control unit provides a motor rotating the fixture in both directions. Speed of rotations is set by dials and time of sequence by foot switches. Units are engineered to fit particular inspection jobs.





SPRING TESTER—*Carlson Co, 277 Broadway, New York 7, N Y.* This tester is for checking loads and deflections of compression and extension springs; speed varies from 300 to 600 tests per hr. The instrument loads up to 300 lb, spring dias up to 4 in., lengths up to 12 in. for compression and 10 in. for extension.

SPRING TESTER—*The Carlson Co, 277 Broadway, New York 7, NY.* Loads and deflections of small compression and extension springs are accurately measured by this spring tester. Capacity is ½ oz. to 25 lb. The scale is said to be accurate within ¼ of 1 percent. Springs with diameters to 2 in. in length to 10 in. can be tested.

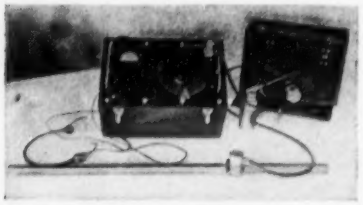
PRESSURE-TESTING UNIT — *Modern Industrial Engineering Co, 14230 Birwood, Detroit 4, Mich.* A pressure testing machine designed for detecting and locating leaks is gas passages in cast-iron automotive-engine exhaust manifolds by the use of air pressure and an illuminated water tank. Pressure loss over a given preset test time is indicated by a gage in the head of the machine.

TORQUE TESTER—*General Electric Co, Schenectady 5, N Y.* Tester shows how the torque of a small ball bearing varies as a function of the angular position during a continuous slow rotation in either direction. Bearing torque is determined by measuring the current drawn by a torque motor.

ELECTRO-HYDRAULIC CHECK BENCH—*J N Fauver Co, Inc, 49 West Hancock, Detroit 1, Mich.* Tests the brake-light switch for a large automotive manufacturer. 2500-psi hydraulic pressure is applied to the switch as a pressure breakdown test and to assure seating of the metallic pressure-diaphragm. 130-psi hydraulic pressure applied to determine that the switching element makes contact between 60 and 110 psi.

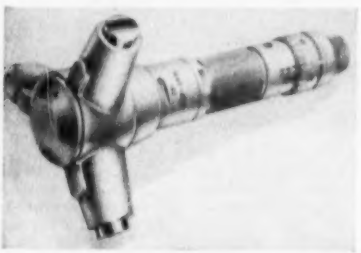
ELECTROMATIC TESTER — *Tinius Olsen Testing Machine Co, Easton Road, Willow Grove, Pa.* Electromatic tester provides accuracy and sensitivity even in the low ranges; plus ability to handle long specimens. Compression and transverse tests can now be made in addition to tension. Available in 20,000-, 12,000- and 5000-lb capacities as standard.

HARINESS TESTER—*Pacific Transducer Corp, 11921 West Pico Blvd, Los Angeles 64, Calif.* Hardness of steel alloys and other metals in the range of R, 25 to 65 can be checked with a portable tester with an accuracy said to be within ± 1½ points on the C scale. Included are a microball indentor, a measuring microscope, and a standard hardness test block.



ULTRASONIC MICROMETER—*Branson Instruments, Inc, 430 Fairfield Ave, Stamford, Conn.* Measurements within ⅛ of 1% of actual thickness have been obtained from one side of smooth-surface materials with the Audigage ultrasonic micrometer. Device can be used on steel, brass, aluminum, copper, glass, and other dense substances capable of transmitting the ultrasonic waves generated by a vibrating crystal.

MICROMETER — *Karl A Neise, 381 Fourth Ave, New York 16, NY.* Each tool is accompanied by an inspection slip stating the exact amount of error at five different points in the range. This is said to be below 0.00005 in. throughout the entire range. Known as the Mastermike.



INTERNAL MICROMETER — *Brown & Sharpe Mfg Co, Providence 1, RI.* The Intrimik measures bores and holes directly — eliminating many setting rings and plugs for different size holes. It measures in increments of 0.0001 in. from 0.275 to 0.500 in. or 0.002 in. from 0.500 to 4.000 in. at depths of 2 in. in the three smaller sizes and 3 in. in larger sizes.

MICROMETERS — *Central Tool Co, Cranston, RI.* With the exception of the 510MBM main journal unit, are now available with a satin chrome finish, said to resist rust, stains, scratches, and wear; provides a non-glaring surface to facilitate reading measurements.

MICROMETER — *George Scherr Co, Inc, 200 Lafayette St, New York 12, NY.* A hard, non-peeling surface, Lustro Chrome, provides a dull background against which graduations stand out sharply. The finish is said to protect the micrometer indefinitely from rust and discoloration.

INTERNAL MICROMETER — *Size Control Co, 2500 W Washington Blvd, Chicago 12, Ill.* Three feelers slide in a measuring head, being pushed outward by a screw-threaded taper. The pitch of the screw cut on this taper also serves as the micrometer measuring screw. Known as the Imicro (Swiss) the accuracy of reading is said to be 0.0002 in. and tests prove it is possible to measure with a tolerance of 0.0001 in.

MICROMETER—*Techno Exports, 15 Whitehall St, New York 4, N Y.* The measuring range of this imported Steinmeyer precision micrometer is from 0 to 1 in. and has graduations of 1/1000 in. and vernier for measurements up to 0.0001 in. Accuracy over the full space is within 0.0001 in.

ELECTRONIC CALIPER GAGE — *Brown & Sharpe Mfg Co, Providence 1, RI.* Adjustable measuring pressure for in-the-machine measurements. Also new during the year was the Brown & Sharpe Intrimik—a new internal tripoint micrometer. It measures bore and hole sizes to 0.0001 or 0.0002 in., depending upon size, and a range of from 0.275 to 4.000 in.

CALIPER — *Transocean Trading Co, 6453 Santa Monica Blvd, Los Angeles 38, Calif.* Baltic model 1-8, vernier caliper imported from Sweden, has a capacity of 0.001-in. accuracy for inside, outside, depth, and thread measurements of 6 in.

MAGNIFICATION CHECKER—*Engineers Specialty Div, The Universal Engraving & Colorplate Co, Inc, 980 Ellicott St, Buffalo 9, NY.* For use on all makes of optical comparators and profile projectors. It uses a new reticle principle to accurately check the magnification comparators at 10, 20, 25, 31.25, 50, 62.5, and 100x.

INDICATOR SNAP GAGE — *Vinco Corp, 9111 Schaefer Highway, Detroit 28, Mich.* Has a straight-sided rack tooth or a cylindrical section representing a measuring wire on the bottom and top jaws. Top jaw is movable and actuates the dial cushion movement indicator which is calibrated in increments of 0.0001 in. A thumb-operated button lifts the upper jaw, permitting the gage to be placed over the splined shaft that is to be inspected. Only the actual tooth thickness is checked, at or near pitch diameter.

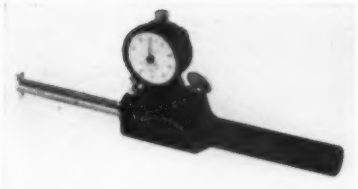
DYE INSPECTION—*Met-L-Chek Co, 121 N Prairie Ave, Hawthorne, Calif.* The Met-L-Chek process detects cracks, pores, and cold shuts in metal parts which are often microscopic in size and cannot be seen by the inspector. In contrast with other dye-inspection processes, only two solutions are required—the dye and the developer.

DYE-PENETRANT INSPECTION — *Turco Products, Inc, 832 E 62nd St, Los Angeles 1, Calif.* Following precleaning by vapor degreaser, red Chek-Spek penetrant is applied to parts being inspected. After time allowed for it to enter even the smallest defect, white developer pulls out dye which has remained trapped in existing flaws.

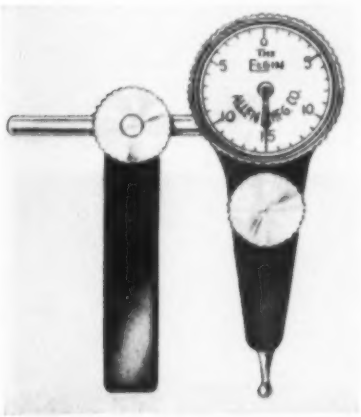
STAGING FIXTURE—*Engineers Specialty Div, The Universal Engraving & Colorplate Co, Inc, 980 Elicott St, Buffalo 9, NY.* Standard staging fixture can be used on AO optical projection comparators and similar equipment with horizontal illuminators and standard base grooves in their work stages. Although designed for holding parts having up to ½ in. dia, suitable V's can be easily machined in the fixture.

SCREWGAGE — *Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Especially adapted for determining number size for machine and wood screws, will gage all sizes from No. 0 to No. 14 by calibrations on right-hand side of tapered slot. On left-hand side is a graduation by 32nds to determine dias of rods, shafts, etc.; dias varying by 64ths can be determined accurately.

CENTER DISTANCE GAGE—*Sorensen Center-Mikes, Inc, 264 Kossuth St, Bridgeport 8, Conn.* Center-Mike is a vernier gage and a slide rule combined. Inspectors can measure distance between hole centers quickly and accurately without knowing diameters. Three sizes measure from 0.240 in. min. to 4.400, 7.400 and 12.400 in. max. With the standard model, holes must be larger than 0.200 in. dia.



DIAL INDICATOR — *Reliant Industries, 4947 Firestone Blvd, South Gate, Calif.* Dial indicator gage sets are for inspection of internal O-ring grooves from ⅜ to 1⅞ in. Special sizes are designed to individual requirements.



DIAL INDICATOR—*Glore Industries, 2214 E 75th St, Chicago 49, Ill.* Unbreakable crystal and enclosed shank minimize gumming up from abrasives and greases. Adjustable dial is calibrated in thousands and has a range of plus or minus 0.015; 0.030 in. overall. Tip movement is magnified 100 times so that needle movement is apparent for as small a variation as 0.0002 in.

DIAL INDICATOR GAGE—*Boice Mfg Co, Box 1098, Poughkeepsie, NY.* Unit was designed for use in the jet industry, but is applicable wherever the problem of checking large ID or OD occurs. Gaging contact is retractable so that gage can be inserted into the bore. Depth of gaging is controlled by rests which contact the face of the workpiece.

DIAL INDICATOR — *Taylor Instrument Co, Rochester 1, N Y.* This instrument is for temperature, pressure, and load applications. Its wedge-shaped pointer is provided with a microadjustment, and the movement is made out of stainless steel.

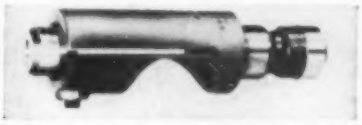
POWER ELEVATION ATTACHMENT—*Jones & Lamson Machine Co, Springfield, Vt.* For optical comparator is a self-contained motor drive unit which will raise or lower the work table faster than it can be positioned by hand, and thus increase convenience of operation.

TEST INDICATOR—*Lufkin Rule Co, Saginaw, Mich.* This universal dial test indicator has a 1½-in-dia dial and a contact point attached to a spindle or plunger which extends out of the back of the case perpendicular to the dial. Slightest movement of this contact point is indicated on the dial face by the pointer hand.

DIAL-INDICATOR HOLDER—*Martin Machine Tools, 315 Bond Bldg, Washington 5, D C.* Has a magnetic base with a 45-50 lb pull permitting immediate application of dials without clamps or special attachments. Overall length is 6½ in. with 0.250 dia. Adaptor bushings are available.

DRILL POINT GAGE—*F T Griswold Mfg Co, Devon, Pa.* New drills and resharpened drills can be inspected with this hand tool to make certain that drill lips have been ground to equal angles and equal lengths. "Point-Chek" will measure included angles up to 145 deg. and two lip drills from No. 80 to one inch.

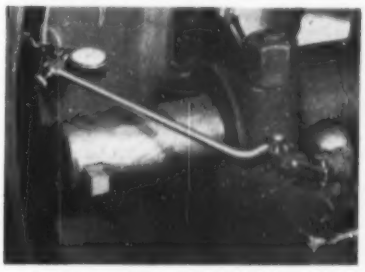
INDICATING GAGE—*Standard Gage Co, Inc, Poughkeepsie, NY.* Increased scope of dial bore gage line is now available with the addition of No. 00 Model suited to bores between ¼ in. and ⅜ in. This model will check tolerances up to 0.005 in. with an accuracy of 0.0001 in.



CONTACT GAGING—*Moore Products Co, Philadelphia 24, Pa.* Contact gaging fixture is available for measuring work with a coarse surface finish. Rigid upper part of the fixture, capable of supporting the weight of the workpiece, contains a pneumatic measuring nozzle. Flexible lower part contains nozzle seat. When the work is placed over the end of the plug, the clearance between the nozzle and seat corresponds to the minimum dia of the bore.

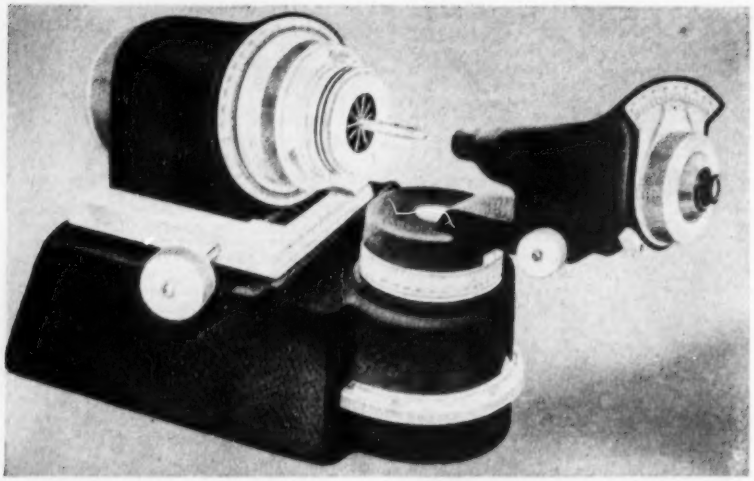
INDUSTRIAL SCALES—*Toledo Scale Co, Toledo, Ohio.* Speedweigh scales for industrial packaging and check weighing are equipped with an oversize dashpot to eliminate indicator oscillation. Indicator travels one full inch to each oz.

DIAL INDICATORS — *Transocean Trading Co, 6453 Santa Monica Blvd, Los Angeles 38, Calif.* This British-made Verdict line comes in a wide assortment of models with all attachments for adaptation to machine tools, height gages, surface gages, and magnetic bases.



MAGNETIC DIAL-INDICATOR HOLDER—*Cullen Mfg Co, Racine, Wis.* The Model-200 magnetic holder has a precision adjusting device controlling the positioning of the dial-holding rod. This prevents spring tension in the rod lifting the indicator off the work after the rod and indicator is placed by hand.

DIAL BORE GAGE—*Standard Gage Co Inc, Poughkeepsie, N Y.* This addition to a line of dial bore gages has been especially designed for the quick, accurate inspection of small-dia bores from 0.250 to 0.375 in. and will check tolerances up to 0.005 in.



TAP ANALYZER—*Stocker & Yale Inc, Marblehead, Mass.* Measures hook directly without the tap moving to be sectioned. The head may be rotated through 360° around its own axis. Calibrated dials permit direct reading of amount of rotation to an accuracy of 30′ of arc. A Jacobs Rubber-Flex collet chucks shanks from 1/16 to 1⅜-in.-dia.

GOLD MASTER BLOCKS—*The F A Ringler Co, Detroit, Mich.* A set of precision reference specimens of surface roughness in pure-gold master blocks has been developed. First replicas of the gold blocks will be a combination of five so-called roughness values, the five most commonly used now in machining of parts surfaces.

GAGE BLOCKS — *Webber Gage Co, Triskett at W 129th St, Cleveland, Ohio.* Croblox, chrome carbide gage blocks, expand in nearly the same degree as steel. Corrosion-resistant blocks have a surface finish of 1 microinch. 2-, 3-, and 4-in. units are provided with bakelite finger grips to shield blocks from body head.

GAGE BLOCKS—*DoAll Co, 254 N Laurel Ave, Des Plaines, Ill.* Chromium-carbide gage blocks have an expansion coefficient identical with steel. They can be used interchangeably, weigh about the same as steel blocks, and half as much as tungsten-carbide. Wearability is many times that of other materials.

CARBIDE INDICATOR POINTS — *The Eastern Tool Co, East Hartford, Conn.* Sets of carbide indicator points contain five standard points flat face, ball point, needle point, conical point, and convex face. They are also available in sets of six and of any one shape. Cases are mahogany.

WEIGHT SLIDE RULE — *Warren-Knight Co, 136 North 12th St, Philadelphia 7, Pa.* Model-C rule has been redesigned to have a standard Duplex construction with only one slide and a cursor. Determines the weights of lead, copper, brass, steel, cast iron, aluminum, or magnesium in any size or shape. It can also be used to calculate areas and volumes.

MAGNETIC-BASE TEST SET — *Chicago Dial Indicator Co, Dept D, 180 N Wacker Dr, Chicago, Ill.* A strong, 110-lb pull Alnico permanent magnet in the base of this test set enables it to be positioned quickly on flat or curved surfaces. A flick of the finger releases the magnet, and the set can be moved or positioned without jarring the indicator.

THREAD GAGES—*The Pipe Machinery Co, 908 E 70th St, Cleveland, Ohio.* These thread gages light in weight with a long wear life, are made of a combination of titanium and carbide known as Denmark. The gage eliminates the need for building "wear allowance" into it.

MULTIPLE GAGE — *Sheffield Corp, Dayton 1, Ohio.* Checks main bearings on automative crankshafts—for size and taper pilot-hole diameters; flange diameters and runout; thrust-bearing faces; keyway locations, etc. A range of dimensions up to 34 or more can be gaged and read simultaneously by a glance at the float graph on top of the unit.

COBALT-60 RADIOGRAPHY SOURCES—*Tracerlab Inc, 130 High St, Boston, Mass.* Nineteen Cobalt-60 sources ranging in strength from 50 millicuries to 25 curies are available for the nondestructive inspection of metal objects for flaws.

PROJECTION COMPARATOR—*Engineers Specialties Div, The Universal Engraving & Colorplate Co, Inc, 980 Ellicott St, Buffalo 9, NY.* 30-in.-dia frosted-glass screen conveniently positioned at the operator's eye level. It provides for minute inspection and measurement of jet-engine and other blade contours. It is designed to be used with the ESD blade-contour checkers and has a micrometer stage. Capacity is for blades having up to 2½-in. chordal width and up to 6 in. between top and bottom sections.

GAGING HEAD—*Sheffield Corp, Dayton 1, Ohio.* Plunjet has been developed for use in conjunction with Precisionaire and other makes of air gages for wide tolerance work. Head is calibrated by a feeler gage having min and max limit elements. Normal and reverse units are available in three standard ranges: 0.040, 0.020, and 0.010.

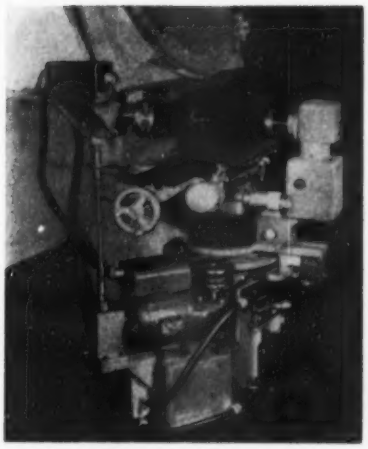
PITCH DIA GAGE—*Nilsson Gage Co, Poughkeepsie, N.Y.* Portable Nilco dial gage is designed to check pitch dia. of gears and splines, or any other overall measurement. Floating rolls simulate standard measurements with the rolls as gaging points or anvils.

COMBINATION MAGNETIC BASE HOLDER—*Enco Mfg Co, 4524 W Fullerton Ave, Chicago 39, Ill.* Mounts to curves or flat surfaces instantly. Miti-Mite No. 120, includes a magnetic base holder, a double-lens 4-power magnifier and complete accessories for holding most small dial indicators.

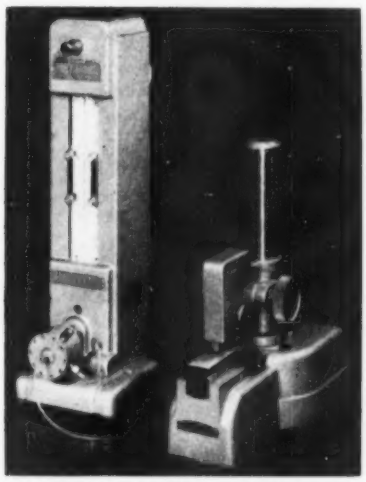
ELECTRONIC PRODUCTION GAGE—*Graham-Mintel Instrument Co, 735 Carnegie Ave, Cleveland 15, Ohio.* The Par-Ac electronic production gage is said to be a high-precision shop instrument for repetitive dimensional gaging on long-run, short-run, or toolroom work, in definite fractions of an inch. It consists of (1) an induction-type gage head mounted on a stand and (2) a high-stability 4-tube amplifier.

GAGE PARALLELISM—*Engis Equipment Co, 431 S Dearborn St, Chicago 5, Ill.* Projection Angle Dekkor is an auto-collimating unit which shows on a projection screen direct readings of squareness of a reflecting surface placed into the path of its light. Suitable reflectors are available for measuring squareness of holes to reference surfaces, parallelism, and other applications where reflectors can be placed on surfaces to be checked.

GAGING FIXTURE—*Pratt & Whitney Div, Niles-Bement-Pond Co, W Hartford, Conn.* Checks the bore of refrigerator compressor housing for average at several points along entire internal wall. Amount of air escaping from six cartridge-type gaging nozzles give a reading on the indicating meter which is calibrated with full scale of 0.016 in.



TRACING ATTACHMENT — *Jones & Lamson Machine Co, Springfield, Vt.* For optical comparators is used for inspecting surfaces that cannot be projected or reflected. It is shown here inspecting a component of an automatic transmission.

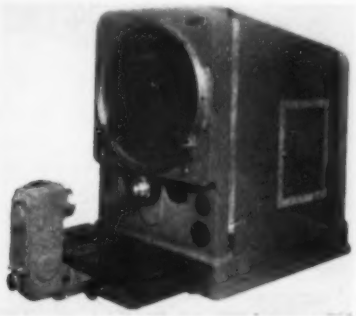


GAGE-BLOCK COMPARATOR—*Sheffield Corp, Dayton 1, Ohio.* Precisionaire gageblock comparator is said to offer an ideal means of measuring thickness of precision gage blocks by air. There is no gage point contact—the only pressure exerted on the block is that of a steram of air flowing from the jets across the upper and lower surfaces.

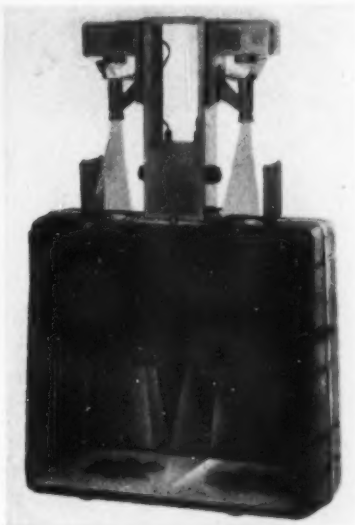
BOLT AND NUT GAGE—*Sorrell & Sons Co, 295 Argyle Road, Rocky River 16, Ohio.* Made of hard, wear-resisting poly-styrene plastic in bright colors this tool will gage bolts and screws from No. 8 through ¾-in. dia. nuts from No. 8 through ⅝-in. dia. The plug gages tell not only the dia. of the nut, but whether it is coarse thread (USS) or fine (SAE).

CARBIDE THREAD RING GAGES—*Hanson-Whitney Co, Hartford 2, Conn.* Because of the hardness and wear resistance of inserted carbide segments, these rings maintain initial accuracy over long periods of time. They can be reserviced for wear and may be used as master or reference rings. Claimed to deliver between 30 and 50 times more inspected parts than regular steel thread rings.

COMPARATOR GAGE — *The DoAll Co, Des Plaines, Ill.* By flicking a switch, any one of the four ranges is selected so that parts can be checked with the range best suited to their tolerance. Spindle pressure is adjustable from four to 40 oz. The standard models in the series have a capacity of 6½ in. height and 4 in. depth.



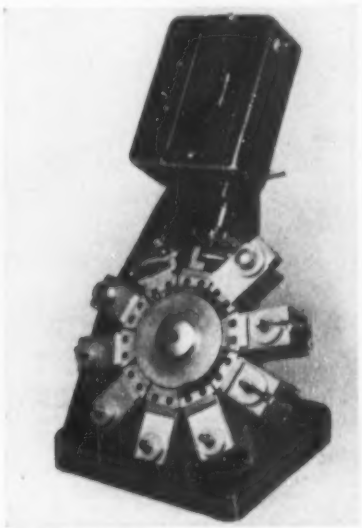
OPTICAL COMPARATOR—*Portman Instrument Co, 6 Manhasset Ave, Port Washington, N Y.* A 16-in.-dia image screen and plain horizontal work stage feature the Model B-50 comparator. Magnifications of 10, 20, 31.25, 50, 62.5, and 100X are obtainable as standard equipment. The working stage area is 6x16 in.



SURFACE COMPARATOR — *Brush Development Co, Instrument Div, 21G, 3405 Perkins Ave, Cleveland 14, Ohio.* The BL-122 provides comparison projection of two Faxfilm replicas at 30-dia magnification. Its principal uses include comparison of work specimens with standard finishes and surface roughness inspection.

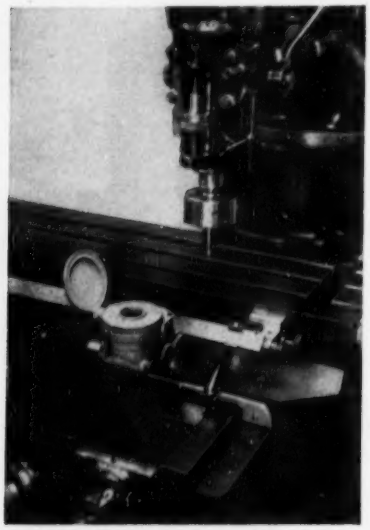
POCKET MICROSCOPE — *National Instrument Co, 5005 Queensbury Ave, Baltimore 15, Md.* A 50X pocket measuring microscope, called Optometer, has an engraved scale mounted in the body tube which reads directly to 0.002 in. Estimations can easily be made to 0.0005 in. Tool, about the size of a fountain pen, is placed on the surface of the part to be inspected, and a light is directed obliquely toward the tapered opening.

OPTICAL COMPARATOR—*Portman Instrument Co, 6 Manhasset Ave, Port Washington N Y.* Condenser lens on this comparator is power cooled and when used with color filters, the intensity and shading of light may be varied. Entire stage and workpiece can be swung completely to one side, facilitating change-over of lens units without disturbing work setups.



MECHANICAL COMPARATOR—*Cosa Corp, 405 Lexington Ave, New York 17, N Y.* The Sigma mechanical comparator has the head mounted in an inclined position on a pedestal fitted with a 10-station indexing turret. Each station holds a fixture to check one of 10 dimensions.

SURFACE COMPARATOR — *Kota-Meters, Inc, 2311 Burbank St, Dallas 19, Tex.* This portable electronic surface comparator has a roughness range of 1 to 100 microinches rms. It evaluates the quality of a surface finish, and the index in microinches rms is indicated on a meter with the needle at an arrested position.



OPTICAL TOOL—*F T Griswold Mfg Co, Wayne, Pa.* Scan-A-Scale provides a precise and simple optical method of making linear measurements on machine tools. It consists of two microscopes and two satin-chrome-finish scales graduated in increments of 0.050 in.

TEMP-CHECK PROBE—*Weber Gage Co, Cleveland, Ohio.* With power supplied by two flashlight batteries, Temp-Check gives a dial reading of temperature of metals, liquids, or air within the range of the instrument. Reading is obtained by placing the probe on the object to be measured.

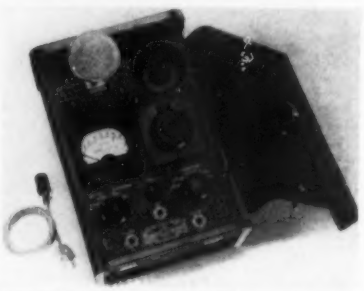
TRACTION DYNAMOMETER — *W C Dillon & Co, 1421 S Circle Ave, Forest Park, Ill.* Can operate electric warning signals, relays, motors, switches, etc. It can be set for any loading point between 0 and 100,000 lb. Does not depend upon springs but works upon the principle of deflecting a calibrated beam.

LEVEL—*The Speed-O-Bore Mfg Co, Inc, 88-08 32nd Ave, Jackson Heights, L I, N Y.* Speed-O-Bore, a small level encased in a machined housing, to which is attached a flexible band, can be fitted to any size drill or ratchet for more accurate drilling.

BALL-BEARING GAGE — *Pratt & Whitney, Div Niles-Bement-Pond Co, W Hartford 1, Conn.* This Electrolimit comparator gives fast, accurate measurements of the radial internal clearance in ball bearings.

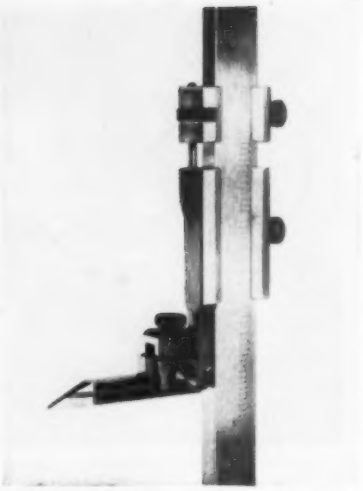
INSPECTION TRAYS — *Durable Formed Products, Inc, 329 Canal St, New York, N Y.* Consists of one pickup tray formed of 0.093 in. Boltaron sheeting, and is 11x9¾x1¼-in. deep, and three insert trays of 0.062 Boltaron, each 4½x4¼x1-in. deep. Boltaron, a copolymer plastic, is light-weight, nonchipping, non-contaminating, and resists oils, alkalies and solvents.

ELECTRONIC STETHOSCOPE — *Anco Instrument Division, American Name Plate & Mfg Co, 4254 W Arthington St, Chicago 24, Ill.* Known as the Elec-Detec, this electronic stethoscope employs a metal probe which serves as a microphone to localize the exact source of noise.



SOUND-LEVEL METER — *General Radio Co, 275 Massachusetts Ave, Cambridge 39, Mass.* This sound-level meter has been designed to take advantage of new tubes, components, and miniaturization techniques, resulting in a smaller, lighter, and more useful instrument. It weighs only 11 lb.

MAGNIFIER—*Bausch & Lomb Optical Co, Rochester, NY.* Pocket-clip 10-power magnifier has been designed for inspection of small parts castings, small joints and welds, reading micrometer and other fine scales. Uses two penlight batteries and bulb for illuminating the object. Lens construction of the 2½-oz unit allows light from bulb to go directly through lens and onto the object, without any direct light reaching operator's eye.

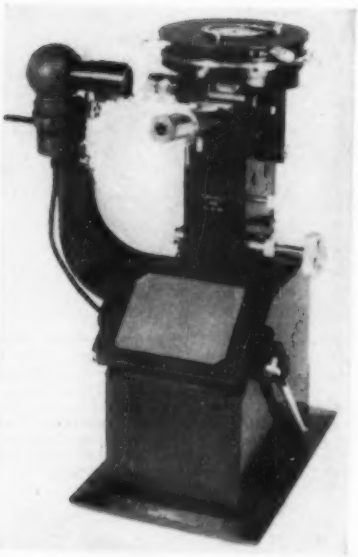


HEIGHT GAGE — *Homestrand Inc, Larchmont, NY.* Universal clamp eliminates need of an extra attachment when using dial gages. Clamp can be used with Vipp dial indicator, the "Last Word" universal-shank dial indicator, and the Brown & Sharpe No. 725 dial attachment, and others. An extra screw on the side of the clamp simplifies shank-width adjustments.

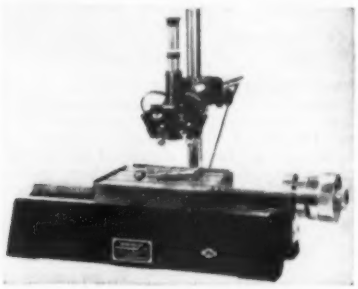
UNIVERSAL HEIGHT GAGE—*Brand Tool & Supply Co, 907 S Victory Blvd, Burbank, Calif.* Height gage has a movable, differential scale for measuring or marking at any point up or down. With a special dial-indicator holder it may be used as a platform gage.

GAGING SYSTEM—*The DoAll Co, 254 N Laurel Ave, Des Plaines, Ill.* A series of gage-block holders and end standards are used to construct gaging and layout setups up to 72 in. long in steps of 0.000025 in. A precalibrated dial indicator is used with the holders and end standards for constructing precise indicating gages.

HEIGHT GAGE—*The L S Starrett Co, Athol, Mass.* This gage has a 13-in. scale which permits taking readings over a full 12-in. range in thousandths of an in. The bottom of the base and scriber are hardened and lapped and the bar is hardened with machine-divided graduations.



MICROSCOPE—*William J Hacker & Co, Inc, 82 Beaver St, New York 5, N Y.* Reichert Universal ME&F metallographic unit combines camera and microscope in one instrument. Picture size of the camera is 3½x4 in., range is from 4.5 to 2200.

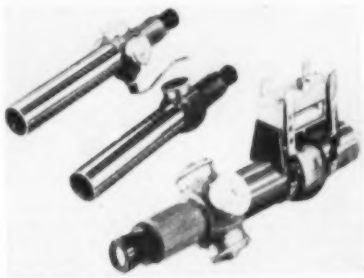


MICROSCOPE — *Boeckler Instrument Co, PO Box 181, Tucson, Arizona.* A 10½-in. working range, with acceptance of pieces 8½ in. high and up to 150 lb in weight feature this toolmaker's microscope. It is possible to position the microscope tube over any line of motion of the work through action of the overarm, which has a reach of 11 in.

ALIGNMENT TELESCOPE—*Joel Fox Co, Inc, 1110 Seward St, Los Angeles 38, Calif.* Align-A-Scope for optical tooling has telescopes with magnifying eye pieces to be used either parallel or at right angles to the line of sight. An optional micrometer can displace the line-of-sight either vertically or horizontally, within 0.050 in.

DARK-FIELD MICROSCOPE — *Dept 000, American Optical Co, Buffalo 15, N Y.* Useful in examining micro particles of a refractive index and color similar to the medium in which they exist.

WIDE-FIELD MICROSCOPE—*Pacific Transducer Corp, 11921 West Pico Blvd, Los Angeles 64, Calif.* Can be attached to any make of jeweler's lathe for inspection and operation. Provides fixed magnification of either 20 or 40X, with or without a reticle. Swings out without losing focusing adjustment.



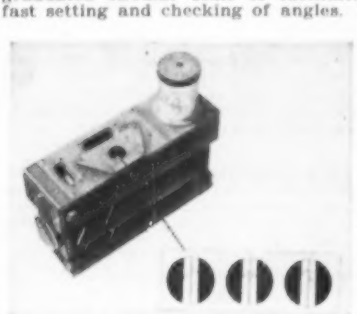
ALIGNMENT TELESCOPE — *Engis Equipment Co, 431 Dearborn St, Chicago 5, Ill.* This telescope permits checking point alignment to 0.001-in. Accuracy over distances from 18 in. to 150 ft. It is now available with built-in, auto-reflection unit. The magnification is 30x and 45x with built-in optical micrometers to check alignment.

OPTICAL TOOLING — *Joel Fox Co, Inc, 1110 N Seward St, Los Angeles 38, Calif.* Align-A-Scope has eyepiece designed to be positioned either parallel to line of sight or at right angles to it. Operating valves control and indicate the amount of displacement within 0.001 in. A 3½-in.-dia spherical steel mounting ball is integral and concentric with the barrel of the scope.

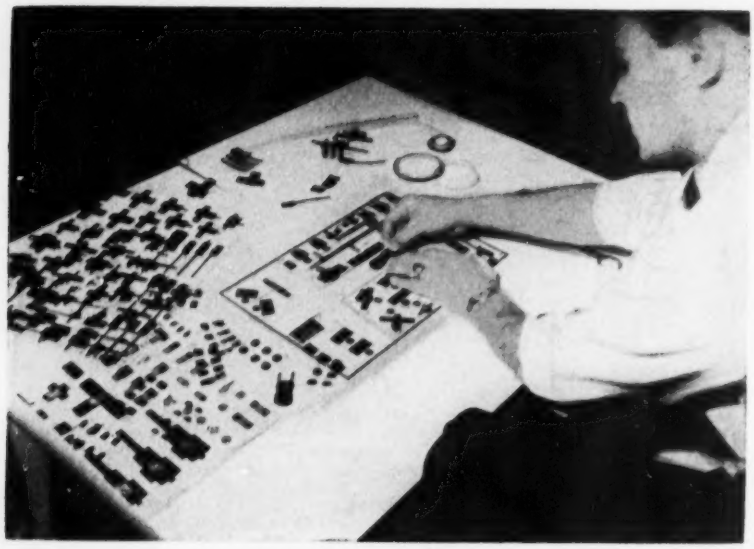
GRAPH E3—*Tech-Art Graphs, 315 S 15 St, Philadelphia, Pa.* Permits scaling designed to represent an inversion of the six faces of a cube; each of the planes is a grid, graduated in perspective foreshortening, from which dimensions may be plotted and projected.

STAND—*United States Testing Co, Inc, 1415 Park Ave, Hoboken, NJ.* Theodolite stand has a cast iron base and is adjustable for carefully controlled change in position when aligning aircraft jigs and fixtures. Maximum column adjustment is 12 in.

COLLIMATOR — *Optical Div, Safe Flight Instrument Corp, 4 Water St, White Plains, N Y.* The instrument is a special type of auto-collimator revolvable with reference to a precision-graduated circular scale to facilitate fast setting and checking of angles.



LEVEL—*F T Griswold Mfg Co, West Lancaster Ave, Wayne, Pa.* Optical level measures flatness, straightness, and parallelism — reading deviations from the horizontal of 0.00012 in. per ft of length. Deviation from the horizontal is measured by a large dia, graduated micrometer thimble and barrel.



PLANT LAYOUT — *Repro-Templets, Inc, Oakmont, Pa.* Repro-Templet method of plant layout enables two-dimensional layouts to be made with speed and accuracy. Machine tool and shop equipment templets, together with film grid sheet, ⅛ in. colored tape, pressure-sensitive adhesive, provide all the material that is needed to make a layout.

PROFILE PROJECTOR — *Engis Equipment Co, 431 Dearborn St, Chicago 5, Ill.* 200-in. Profile Projector has two sets of precision optics and a horizontal screen 60-in. dia. Optics will give 20x to 100x for work up to 3-in. dia.; 10x for work up to 6-in. dia.

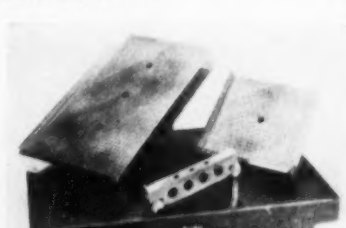
PROFILE PROJECTOR — *American SIP Corp, 100 E 42nd St, New York 17, N Y.* This instrument made by SIP is designed for the accurate and quick inspection of the cross-sections of prismatic pieces, solids of revolution or parts with warped surfaces. Magnifications are accurate to 1/1000 of their nominal value. Regular magnifications, 10 and 20x, Screen Surface, 16½x20½ in.

HIGH-INTENSITY ILLUMINATOR—*Keleket X-ray Corp, 225 W Fourth St, Covington, Ky.* This high-intensity illuminator makes X-ray film inspection of industrial parts quick, easy, and accurate. Light intensity is 20 times greater than conventional viewers. A 14x17-in. viewing surface permits inspection of large films.

ILLUMINATOR—*X-Ray Dept, General Electric Co, Milwaukee 14, Wis.* An iris-diaphragmed, high-intensity viewer is said to allow study of the widest range of X-ray film densities in the industrial field. Opening can be steplessly dilated or contracted from ¼ in. to 5 in.

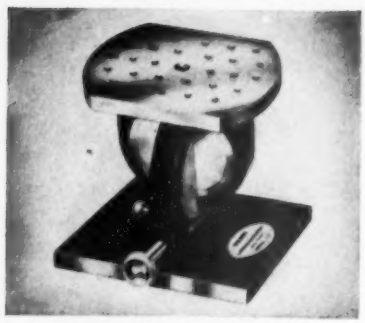
MAGNIFYING INSTRUMENT — *International Standard Trading Corp., New York, NY.* Optical magnifying device, called Inspectoscope, has been designed for inspection of tools, gages, and other mass-produced components. Larger units can be inspected sectionally by moving the instrument across object or unit under examination.

MAGNIFIER—*Bausch & Lomb Optical Co, Rochester, NY.* This electrically lighted magnifier is designed to speed detailed examination of all kinds of materials and products through self-contained direct illumination on the object. Instrument's lens system magnifies five times.



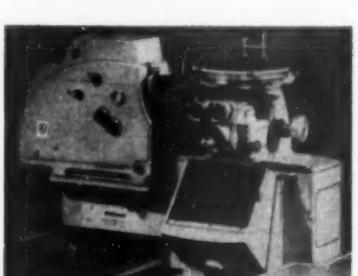
SINE PLATES—*The Do-All Co, Des Plaines, Ill.* Available in two sizes, 5 and 10 in. Top area of the 5-in. plate is 6x6 in., top area of the 10-in. plate is 7x12 in. Large working surfaces enable such jobs as the various degrees of angles of a sine chuck to be accurately check. Either the 5- or 10-in. plate can be used with a 5-in. sine bar.

OPTICAL GAGE—*F T Griswold Mfg Co, Wayne, Pa.* Cam-rise gaging device measures cam contours (both angle and amount of eccentricity) by optical means; deviation in a cam surface at any angle of arc, from minimum to maximum radii can be quickly measured to ten thousandths of an inch. Direct readings can be made to 0.0005 in.; estimates to 0.00025 in.



ANGLE COMPUTER—*Scientific Engineering, 11126 Weddington, North Hollywood, Calif.* Simple or compound angles can be measured within 3 sec. tolerance on the Derry angle computor. The clutch-type of lock secures the angular position. By pulling vernier release pin, angle computer can be set to any desired angle quickly.

DYE-PENETRANT INSPECTION — *Magnaflux Corp, 5900 Northwest Highway, Chicago 31, Ill.* Spotcheck is a dye-penetrant inspection method for locating surface defects in metal, ceramics, plastics, and other solids. The sealed spray cans provide their own pressure.

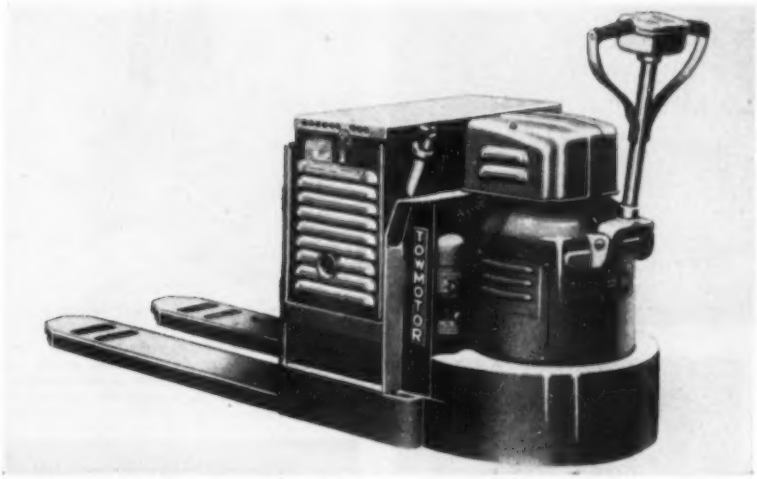


METALLOGRAPH — *American Optical Co, Southbridge, Mass.* This desk-size metallograph permits microscopic study of metals under polarized light as well as phase and bright-field illumination. Final focusing for photography is accomplished quickly, automatically, and accurately while examining the specimen through the parfocal visual system.

X-RAY FILM VIEWER—*X-ray Dept, General Electric Co, Milwaukee, Wis.* Four 14x17 in. or smaller X-ray films may be viewed side-by-side on the unit, dimensions of which are 57-in. wide x 20½-in. high x 7 in. deep. Across the full 4-panel length is a 56-in. sheet of Plexiglas to diffuse the light, covered by a double-strength sheet of protective clear glass.

1953 American Machinist Production Preview

PLANT SERVICE EQUIPMENT



ELECTRIC PALLET TRUCK—*Towmotor Corp, Cleveland, Ohio.* Eliminates conventional electric storage batteries and recharging. A small, gasoline-powered generator supplies constant maximum voltage to operate the truck. It is mounted in a standard battery compartment with gasoline engine, fuel tank, starting battery, and all accessories completely enclosed in one steel housing.

FREIGHT TRUCK — *The Market Forge Co, Everett, Mass.* Reversible shelves on Load-Mobile 2½-ton capacity mover have both a flat and a rail side. Standard ¾-hp series motor gives maximum speeds ranging from 3 to 5 mph, provides power to climb inclines of 5 to 10°, depending on the load.

TRUCK—*Market Forge Co, Everett, Mass.* Designed to operate over woodblock or concrete floors. There are seven openings, each 4⅜ in., wide. The deck portion of the truck is open and fitted wtih short rollers on ball bearings. Capacity is 6,000 lb.

FORK TRUCK—*Market Forge Co, Everett, Mass.* Non-telescopic truck with a maximum lifting height of 56 in. retains the interchangeable-power-unit feature of the Load-Mobile line. The 1-hp motor and non-telescopic lift are additions.

FORK-LIFT TRUCK—*Mobilift Corp, 409 SW 13th Ave, Portland 5, Oregon.* Independent rear-wheel suspension has been put into 3000-lb HR sit-down fork-lift truck. The suspension, designed to cut down driver fatigue and give load and vehicle less shock, consists of a heavy-duty spring and an airplane shock absorber for each rear wheel. Standard mast heights for the HR model are 63, 72, and 83 in.

GAS-POWERED TRUCKS — *Mobilift Corp, Portland, Oregon.* 3000-lb-capacity H model, and HW with 3500-lb capacity. The H model has an outside turning radius of 61⅜ in. and zero inside turning radius, the length less forks is 71 in., width over-all 38 in. HW outside turning radius is 63⅞ in., zero inside turning radius, length less forks 73¼ in., and 38 in. over-all width. Governed speed of both is 6 mph, and speed of lift (loaded) is 50 fpm. Both models are available with standard 63- and 83-in. masts.

TRUCK—*Yale & Towne Mfg Co. Philadelphia 15, Pa.* A 2,000 lb. electric truck with clamping attachment is available for handling light weight packages in storage areas. Hydraulically-powered clamp will open to accommodate crates as wide as 60 in. It can lift crates up to 130 in. in the air for stacking.

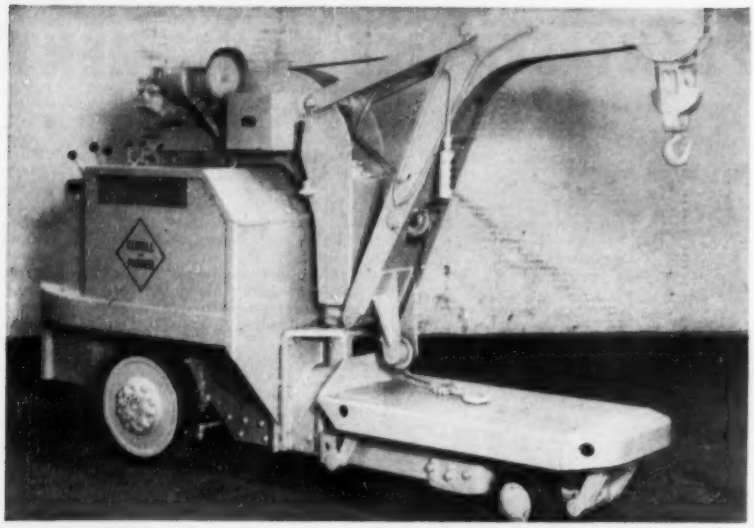
PLATFORM TRUCK—*The Yale & Towne Mfg Co, Philadelphia Div, Philadelphia 15, Pa.* This 4000-lb Worksaver model has a lowered platform height of 6½ in., and will lift loads up to as high as 126½ in. The unit has an articulated frame that permits continuous floor contact of load and drive wheels, despite floor variations.

PLATFORM TRUCK — *The Yale & Towne Co, Philadelphia 15, Pa.* 7500-lb capacity Worksaver, a powered hand truck, has 11-in. high platform with 3-in. lift. Standard platform size is 42 in. long by 26½ in. wide, other sizes are available.

HAND LIFT TRUCK—*Yale & Towne Mfg Co, Philadelphia Div, 11,000 Roosevelt Blvd, Philadelphia, Pa.* These hand trucks have a dual-purpose superstructure that enables them to handle 7- and 12-in. skids as well as single- or double-faced pallets.

PLATFORM TRUCK—*Yale & Towne Mfg Co, Philadelphia 15, Pa.* With an 80-cu-ft end-dump hopper is designed for handling bulky loads of loose material such as sand, gravel, waste, metal chips, etc. Hopper can be tilted downward to scoop up loads.

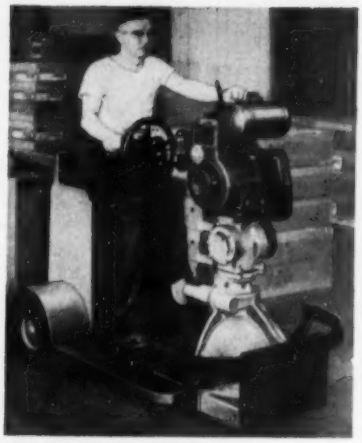
STAND-UP DRIVE TRACTOR—*Market Forge Co. Everett 49, Mass.* The stand-up drive Load-Mobile tractor has been designed for use in warehouses where items are stored on either skids or pallets, one skid or pallet for each item. It hauls up to 10,000 lb of load at approximately 3 mph. No-load speed is 4½ mph.



TRUCK AND CRANE—*The Elwell-Parker Electric Co, Cleveland, Ohio.* In addition to the standard 4000-lb capacity self-loading platform which is designed to lift and transport skids the truck is equipped with a powered winch for pulling heavy loads on or off the platform. The boom swivels 180° and permits hoisting loads weighing up to 2000 lb.

ADJUSTABLE-LIFT TRUCKS — *Big Joe Mfg Co, 184 North Franklin St, Chicago 6, Ill.* Four of these Big Joe models are adjustable fork lifts that will lift 800-lb loads to heights of 52, 66, and 78 in. The 52-in. models are made for both foot- and electric-hydraulic operation.

PLATFORM LIFT—*Big Joe Mfg Co, 184 N Franklin St, Chicago 6, Ill.* Big Joe Model 14S has load capacity of 750 lb. Lifting height is 55½ in., and rear wheels are 10-in.-dia solid rubber. Other features are: positive locking safety breaks, dual ball-bearing 6-in. swivel casters, safety hand grips, hydraulic load raising. Price $256.50 FOB Chicago.

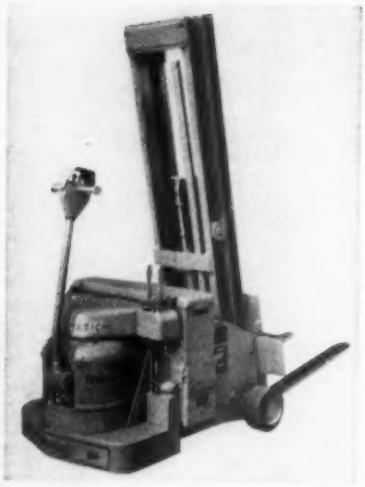


TRACTOR — *Truck-Man Div, The Knickerbocker Co, 537 Liberty St, Jackson, Mich.* Designated the Truc-Tor Model DR, this tractor is capable of hauling cargo trains of up to 13 times its own weight on dry level concrete.

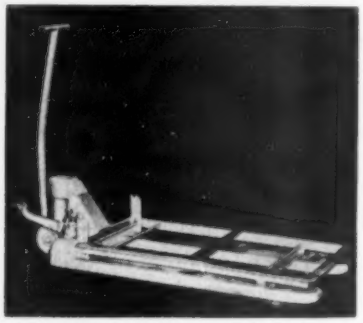
INDUSTRIAL TRUCK — *Truck-Man Div, Knickerbocker Co, 537 Liberty St, Jackson, Mich.* By changing to the Wisconsin Model AKN air-cooled engine, power has been increased on this truck from 4.4 to 5.8 hp.—an increase of 32%. Truck-Man is manufactured in hydraulically operated skid-lift and pallet-lift models. Rated load is 3,500 lb.

TILT-TOP TRUCK — *The Hamilton Tool Co, Hamilton, Ohio.* Positions 2000-lb broach holders to facilitate maintenance operations. The table top 24x96 in., rotates 360° on a horizontal axis and can be locked in place wherever stopped. Capacity is 3000 lb.

FORK-LIFT TRUCK—*Hambro Machinery Div, 17 E 54 St, New York 22, NY.* Wrigley model 350 has been designed to operate in confined areas, gangways, or upper floors. ½-ton unit turns in a tight radius and may be handled with a minimum of training. Fork height closed is 5 ft 8 in.; open, 9 ft 6 in. Turning radius, less forks, 55 in.; with forks, 80 in.



STACKER — *Automatic Transportation Co, Chicago, Ill.* The Series C Transtacker, a battery-powered, driver-led unit, is claimed to be as much as 600 lb lighter than comparable industrial trucks. Its eight available models provide capacities of 500 to 1500 lb.



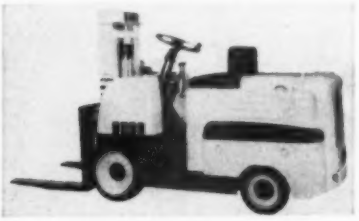
TRUCK ADAPTER — *The Raymond Corp, 4785 Madison St, Greene NY.* This hinged superstructure can be raised out of the way when handling pallets skid platforms—thus a single truck can be used for handling both types of equipment.

PLATFORM TRUCK—*Raymond Corp, 4784 Madison St, Greene, NY.* Platform electric truck has a 4000-lb capacity and will travel up to 5-mph loaded, 6-mph empty. It can be used in truck trailers, boxcars, elevators, and cramped production areas. Available in three lowered heights, 6 in., 9 in. or 11 in., it features a standard 4-in. lift.

A TELESCOPING-FORK EXTENSION—*The Raymond Corp, Greene, NY.* For use on the Raymond Corporation's line of electric trucks it remains on the elevating forks at all times. Formed-steel channel sections with a retaining bar welded underneath fit over the regular elevating forks.

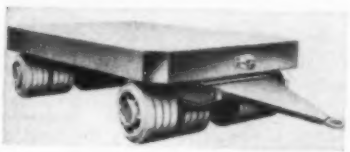
LIFT TRUCK—*Langley Mfg Co, 920 Cambridge St, Cambridge, Mass.* Powrlift Model V for 500-lb capacity, and Model C for 1000-lb capacity operates on electric or battery motor. Electric model is driven by a ½-hp reversing motor with a drum controller. Brakes are elevator and platform is chain lifted, lowered at 17 fpm with automatic mechanical limit stops. It operates from 110-v, cycle line.

FORK-LIFT TRUCKS—*The Buda Co, Harvey, Ill.* Fork lift trucks rated at 3000-lb capacity at a 15-in. load center. Model FT30-15 is powered by a four-cylinder, 49-hp gasoline engine. The FTD30-15 is powered by a Buda diesel engine of identical cubic inch displacement, bore, stroke, mounting dimensions.



FORK-LIFT TRUCKS—*The Buda Co, Harvey, Ill.* 6000-lb capacity fork-lift trucks are available in two models: gasoline-powered model FT60-24 and diesel-powered FTD60-24. Rated at 24-in. load center. A 72-, 84-, 108-, 114-, or 120-in. lift is standard.

FORK-LIFT TRUCKS—*The Buda Co, Harvey, Ill.* Either diesel or gasoline powered, are available in 12 models on solid or cushion tires in capacities of 3000-, 4000-, 5000-, 6000-, and 7500-lb at 24-in. load center and 4000-lb capacity at 18-in. load center.



INDUSTRIAL TRAILER — *Phillips Mine & Mill Supply Co, 2322 Jane St, Pittsburgh 3, Pa.* 60-ton trailer has eight solid rubber-tired wheels. Frame is I-beams and channels with a smooth steel deck. Standard size is 7 ft 6 in. wide, and 12 ft long.

SELF-DUMPING TRAILER—*Phillips Mine & Mill Supply Co, 2322 Jane St, Pittsburgh 3, Pa.* With a 1¼-cu-yd capacity it has been designed for 3-way use—pulling by hand, lifting and transporting by fork-lift truck, and towing singly or in train by industrial tractor.

TWO-WHEEL TRAILER — *Phillips Mine & Mill Supply Co, 2322 Jane St, Pittsburgh 3, Pa.* The Trail-Skid can be pulled by either fork or platform lift truck in general plant hauling. All models have a capacity of 10,000 lb and feature solid rubber-tired wheels with Timken roller bearings.

FORK-LIFT TRACTOR—*Tracto-Lift Co, 2011 Baltimore, Kansas City 8, Mo.* The Tracto-Lift is available in four sizes with lifting capacities of 3000, 4000, 5000, and 6000 lb. Fork length varies from 30 to 60 in. with lifting heights to 12 ft. 6 in. on current models.

FORK TRUCKS — *Ready-Power Co, 3826 Grand River Ave, Detroit 8, Mich.* Diesel-electric power units are now available for trucks in the 4000- lb fork and up to 10,000-lb platform sizes. Model N, complete with fuel tank and starting battery, fits sitdown units without alterations.

WAREHOUSE TRUCK—*The Palmer-Shile Co, 61019 Fullerton, Detroit 27, Mich.* 45 in. long by 28 in. wide by 42 in. high at handle. Platform top is 14 in. off the floor and is built of 3/16-in. plate welded to four 3-in. supporting channels.

STOCK-CHECKER'S TRUCK—*Palmer-Shile Co, 16019 Fullerton, Detroit 27, Mich.* Three steel shelves with a 1-in. flange that prevent material from falling off are built on this truck. A writing table and stationary rack are welded to the steel frame. The tubular-steel handle of the truck also forms a protective bumper for the stationary rack.

MULTI-PURPOSE CART — *Palmer-Shile Co, Detroit 27, Mich.* Sturdily constructed to handle heavy loads and stand up under rough usage. Inside of body is 45 in. long at top, 32 in. long at bottom, 24 in. wide, and 17 in. deep.

HAND DUMP TRUCK—*Palmer-Shile Co, 16019 Fullerton, Detroit 27, Mich.* Designed to catch turnings from screw machines, but can also be used for many other purposes. Top measures 253/4x45 in., bottom 253/4x27 in. Depth is 17½ in. Overall height is 23 in., but it can be furnished higher or lower on special order.

FLOOR TRUCKS—*Service Caster and Truck Corp, Albion, Mich.* Leverlift features toggle boosters and helper rolls that enable it to slip into double-faced pallets without jockeying. Capacity is 4000 lb, and it is available in five standard fork lengths.

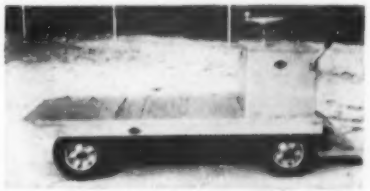
HAND TRUCK — *Magline, Inc, Pinconning, Mich.* Hand truck made of magnesium weighs only 16 lb and has a load capacity of 450 lb.

LIFT TRUCK—*Hyster Co, Portland 8, Ore.* Permits the use of optional additional counterweights on the standard 2000-lb model, thus increasing or decreasing load center or load capacity as the need requires. This has been done by changing the upright assemblies and load-arm pins.

LIFT TRUCK—*Hyster Co, 2902 N E Clackamas St, Portland 8, Ore.* Model 20 has free-lift uprights for use with minimum overhead clearance. Uprights available in 7 ft 8 in.-, and 9 ft 8 in.-heights.

FORK TRUCKS—*Hyster Co, 2902 N E Glackamas St, Portland 8, Ore.* Models ZA-80 and XA-60, have 8,000-and 6,000 lb. capacity. Both are gasoline-engine powered with pneumatic tires. Clutch can be removed or installed in less than an hour.

HYDRAULIC LIFT—*Dept KP, Century Products Co, 5925 Highway 7, Minneapolis 16, Minn.* The Century 1000 weighs only 150 lb and will raise a 1000-lb load from floor level to a height of 4 ft or lower. It is moved manually by push-bar.



POWER TRUCK — *Consolidated Industries, Inc, West Chesire, Conn.* One-ton power truck has 21 sq ft of loading surface, removable 24-in. stanchions which can be stowed in a rack under the platform, and room on each side of engine housing for carrying long objects.

LIFT TRUCK—*Lift Trucks Inc, 2423 Spring Grove Ave, Cincinnati 14, Ohio.* Has standard heights lowered of 6, 7, 9, and 11 in. Lift is 1⅝ to 2¼ in. Handle is free of the lifting mechanism when operator pulls the truck. Capacity: 2500, 3500, and 5000 lb.

ELECTRIC TRACTORS — *The Mercury Mfg Co, 4044 S Halstead St, Chicago 9, Ill.* The medium-duty tractor (illustrated), designated Model A-545, has two-wheel drive and is rated at 400-lb normal and 2000-lb maximum drawbar pull. When powered by the specified 48-volt source it attains a light running speed of 7½ mph.

FURNACE CHARGER TRUCK—*The Mercury Mfg Co, 4044 S Halstead St. Chicago 9, Ill.* Model A-3481, has 4,000-lb. capacity. Load carrier tilts 10 deg. to provide lift necessary to pick up and deposit the loads.

LIFT-TRUCK GUARD—*Mercury Mfg Co, 4044 South Halstead St, Chicago 9, Ill.* Can be installed on both the Yak and Yank lift trucks. Canopy has an over-all installed height of 95 in., which can be reduced to 91 in.

LIFT TRUCK—*Century Products Co, 5925 Highway 7, Minneapolis 16, Minn.* Combination hydraulic-electric lift truck designed for 1000-lb capacity loads, is being marketed for less than $4000. Century 1000-E's electric lift is actuated by a piston hydraulic pump powered by a 6-v motor; current is supplied by an automotive storage battery equipped with a charger.

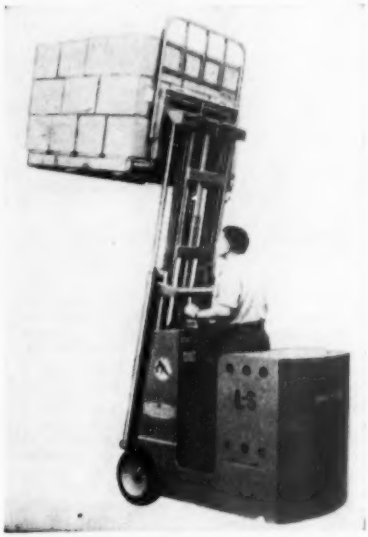
LIGHT WEIGHT FORKLIFT—*Clark Equipment Co, Industrial Truck Div, Battle Creek, Mich.* Yardlift-150 pneumatic-tired forklift truck of 15,000-lb capacity has increased hp, lighter weight, and better hydraulic steering. New power plant develops more hp at fewer rpm; weight reduction of 2300 lb provides increased flotation.

FORK TRUCK—*Clark Equipment Co, Industrial Truck Div, Battle Creek, Mich.* Stoway, can operate within its own length, has a capacity of 2000 lb. at 24 in., 1650 lb at 30 in. Hydraulic service brakes for regular operation and parking go into action when driver removes his foot from the brake pedal, torque braking occurs when travel control lever is reversed.

FORK TRUCK—*Clark Equipment Co, Battle Creek, Mich.* Yardlift 100, has a 10,000-lb capacity at 24-in. load center. Powered by Continental gas engine with 55 brake horsepower at 2000 rpm. Turning radius is 133 in. and lift is 144 in.

FORK TRUCK ATTACHMENT — *Baker Industrial Truck Div, Baker-Raulang Co, 1250 West 80th St, Cleveland, Ohio.* Allow truck operators to control lifting and lowering action of the forks at a distance from the truck's control panel, by the small remote control unit held in the operator's hand. During normal truck operation the remote-control unit clamps over the tie bar on the truck's inner upright.

FORK TRUCKS — *Lewis-Shepard Products, Inc, Watertown, Mass.* Features of this 1500-lb capacity electric fork truck include: a 59-in. turning radius for maneuverability in narrow aisles; a lifting speed of 50 fpm loaded, and a speed of 6 mph.



FORK TRUCK—*Lewis-Shepard Products, Watertown, Mass.* SpaceMaster electric fork truck line features a master controller which governs speed, direction, and braking. Incorporation of magnetic controls allows the master control lever to be thrown into full speed forward with smooth acceleration through each speed. Dynamic braking is accomplished by the master control lever.

FORK TRUCK—*Lewis-Shepard, Watertown, Mass.* Stand-up, out-rigger design, available in three designs: straddle, open fact pallet, and platform. Right-angle stacking can be accomplished in less than 6-ft aisles.

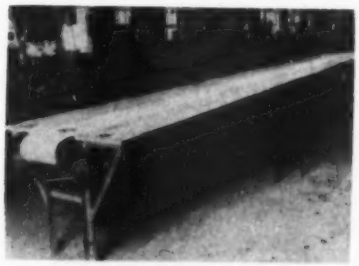
TRUCK—*Lewis-Shepard, Watertown, Mass.* Special stackers have a capacity range from 1000 lb. to 8-10 tons. 16,000-lb. electro-hydraulic coil lifter has a lifting height of 27 in.; it was designed to minimize time and manpower in handling rolls of strip steel.

TRUCKS—*Lewis Shepard Products, Inc, Dept R-1, Watertown, Mass.* Four electric truck models will operate in 6 ft. aisles with 48 in. loads. Model M is a 3,000 or 4,000 lb. riding type outrigger fork truck that will stack 10½ ft. high. Model M low lift transports both load and operator. For short hauls, the JackStacker and JackLift have capacities to 6,000 lb.

FORK TRUCK—*Lewis-Shepard Products Inc, Dept R-1, Watertown, Mass.* Said to be manufactured with heavy-duty components and have stamina for long periods of efficient, full-power service but with slightly less travel and lifting speed.

LOW-LIFT TRUCK — *Lewis-Shepard, Watertown, Mass.* 1000 to 6000-lb capacity walkie truck power doubled with a decrease in length. All controls in handle head. Operator releases his hand pressure on the handle trigger for instant braking. The brake operates with the handle in any position.

SHEAR CONVEYOR — *Fried Steel Equipment Mfg Corp, 528 East 119th St, New York, N Y.* Supports the sheets with air-operated plungers while the edge is against the back gage. Liftveyor-Standard for sheet to ¼ in. thickness; and the Liftveyor-Heavy Duty for plate to ½ in. thickness.



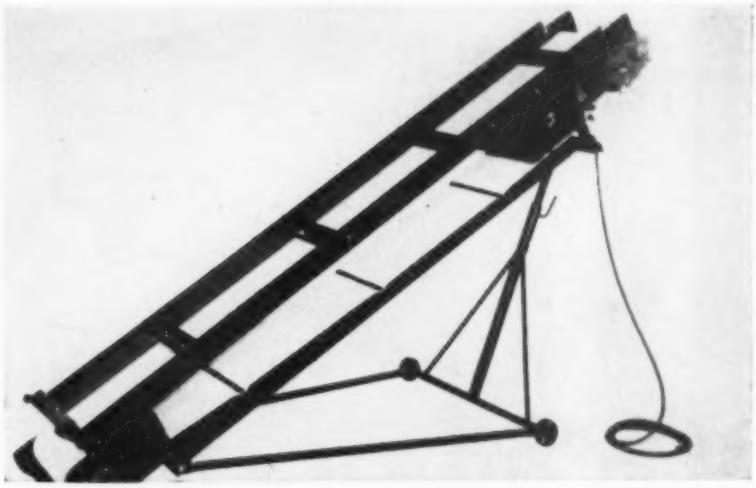
BELT CONVEYOR—*Flexoid Conveyor Co, 1543 E 23rd St, Cleveland 14, Ohio.* Table conveyor has a 12-in.-wide belt but it can be made to any length or width. A variable-speed drive runs the belt at a normal 20 fpm with a maximum of 40 fpm.

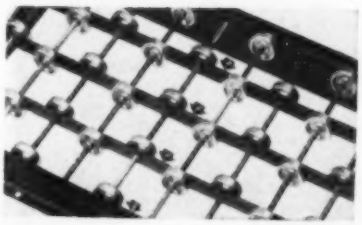
ROLLER CONVEYOR—*Sage Equipment Co, 30 Essex St, Buffalo 13, N Y.* This live-roller conveyor is manufactured in widths from 6 to 36 in. wide. Rollers are 2 in. dia and spaced to meet customer's requirements.

CONVEYOR—*Sage Equipment Co, 31 Essex St, Buffalo, NY.* Pressparts power driven conveyor automatically moves stampings between progressive operations. Built in standard wixes of 6-, 12-, and 18-in. widths, and 6-, 11-, and 16-ft lengths. Equipped with gearhead motors; may be 110 or 220 v, 25 or 60 cycle.

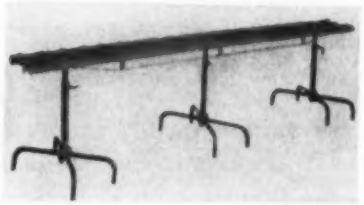
GRAVITY COVEYOR—*The Rapids-Standard Co, Inc, Dept AS, 342 Rapistan Bldg, Grand Rapids 2, Mich.* A gravity conveyor with steel wheels and aluminum frame is said to combine strength with lightness. It is manufactured in 45 and 90 deg. curves, 5, 8 and 10-ft lengths, and 12 and 18-in. widths. Wheel spacings range from 6 to 18 wheels per foot.

OVERHEAD CHAIN CONVEYOR—*US Spring & Bumper Co, 4951 Alcoa St, Los Angeles 11, Calif.* Has short radius curves and track sections easily combined so that quick changes or additions can be made. Handles loads up to 30 lbs on each pendant spaced at 6-in. intervals, or 60-lb loads at 12-in. when supported by two pendants fitted with crossbar attachment.





GRAVITY CONVEYOR — *Rapids-Standard Co, Inc, Grand Rapids 2, Mich.* This wheel gravity conveyor is designed for use in place of bulkier roller conveyors. It has 3½-in. deep channel frames of 12-gage steel for strength and rigidity.



CONVEYOR—*Market Forge Co, Materials Handling Div, Everett 49, Mass.* Twelve-in.-wide heavy-duty Load-Veyor is made in 5- and 10-ft sections, with 45° and 90° curves to suit special and individual needs. Ball-bearing wheel 2 in. in dia and ⅝ in. wide are spaced on slightly less than 3-in. centers.

CONVEYOR BELT — *Main Belting Co, 1241 Carpenter St, Philadelphia 47, Pa.* Made in either of two duck weights, 37½ or 39 oz. Armadillo is an oil buff, stitched canvas belt with an extra-hard, glass-like, yet flexible coating. This coating both sheds oil and resists abrasion. Uses include: conveying oily steel scrap, steel tote pans, steel stampings with sharp edges, cut glass, etc.

CHAIN FOR CONVEYORS — *Acmor Conveyor Chain Co, 17700 Broadway, Bedford, Ohio.* Stock attachments for ACMOR hollow-pin chain are available for all pitches which are either bolted or welded to the chain proper, making it possible to construct an unlimited variety of conveyors.

CONVEYOR — *Rapids-Standard Co, 342 Rapistan Bldg, Grand Rapids, Mich.* Available in 4-, 6-, and 8-ft lengths, with 4-, 8-, and 12-in. belt widths for handling a variety of products. A rigid 12-gage steel bed and guard rails are formed in one piece to prevent parts handled from catching and damage.

TROLLEY HOIST — *The Harrington Co, 17th and Callowhill Sts, Philadelphia 30, Pa.* Available in three capacities, ½, 1, and 2 ton, these adjustable trolley hoists are said to have the advantage of being adjustable for a range of I-beam sizes without dismantling.

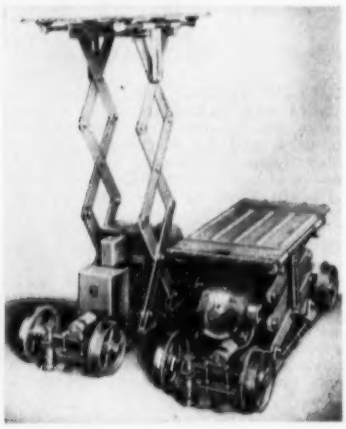
CONVEYOR-BELT TRAINER — *The Rapids-Standard Co, Inc, Dept BT, 342 Rapistan Bldg, Grand Rapids 2, Mich.* Automatically keeps wandering conveyor belts aligned and thus eliminates wear and down-time caused by creeping belts. It can be used on fabric or rubber-covered belts 3/16 in. or more thick, operating at speeds up to 200 fpm.

CONVEYOR—*Fried Steel Equipment Mfg Corp, 528 E 119th St, New York, N Y.* Fried Stripveyor automatically picks up cut strips beyond the shear bed. The unit is adjustable to any height up to 45 in., is synchronous to shear speed, can handle any gage sheet metal up to ⅝ in., and widths as wide as allowable by standard 24-in. back gage.

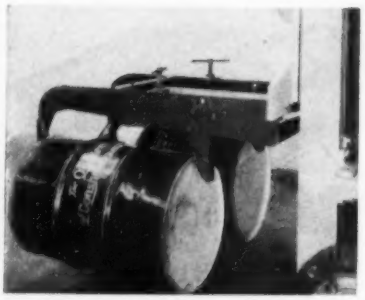
DIE-LIFT TABLES—*Union Tool Corp, Warsaw, Ind.* Heavily-built die-lift tables have table sizes from 30x36 to 44x84 in. with capacities from 4 to 10 tons. Standard elevations are from 30 to 46 in., mechanically operated.

MATERIAL-HANDLING — *Coleman-Petterson Corp, 2106 St, Clair Ave, Cleveland 14, Ohio.* Racks portable, heavy-duty models facilitate transforming and storage of small assemblies and metal, rubber, or plastic parts. Units hold up to 12 removable trays, stacked in 6 rows 12-in. apart. Trays have a capacity of 70-lb. each; racks can handle a total of 1500 lb.

PARTS CARRIER — *Wire & Iron Products, Inc, 1725 Sixteenth St, Detroit 16, Mich.* Eazy-Stack wire basket consisting of a metal frame with custom-made inserts that will handle any shape or material protects highly machined finished parts, decal and plated parts against abrasion. Baskets are made of steel wire, flat expanded metal, wire mesh or perforated metal.

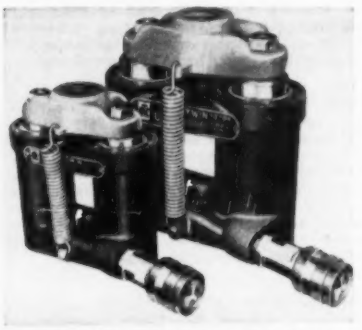


LIFTING DEVICE — *The Hamilton Tool Co, Hamilton, Ohio.* Called Portelvators, these special material-handling devices operate on track which skirts storage cells and processing stations. The units are moved manually and are elevated electrically. Table size is 24 x 36 in. Lift is from 24 to 64 in. above floor level. Load capacity is 600 lb.



DRUM-HANDLING DEVICE—*Towne Mfg Co, Philadelphia Div, 11,000 Roosevelt Blvd, Philadelphia 15, Pa.* Can be attached to any industrial fork truck without removing the forks or making any hydraulic or mechanical connections. It fits over the forks and is attached to them with two screw clamps. One or two standard drums can be picked up by lowering the handler over them, while the truck is slowly backing away.

MATERIALS-HANDLING UNIT—*Albert Wesling & Sons, 2912 W Lake St, Chicago 12, Ill.* This system for handling metal parts is based on a master hardwood unit with slots in the ends and sides permitting a wide variety of space combinations to be set up by use of crosswise and lengthwise dowel dividers.

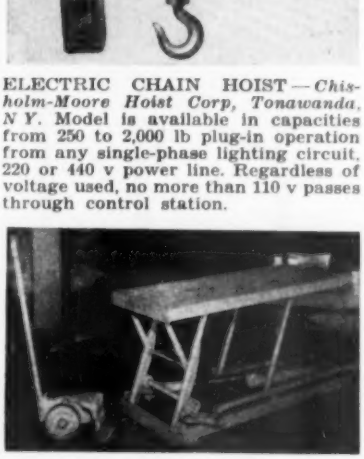


30-TON HYDRAULIC RAM—*Owatonna Tool Co, 383 Cedar Street, Owatonna, Minn.* Weighing only 23 lb and with a centerhole construction, this 30-ton power-twin hydraulic ram does tough pulling and installing jobs.

HOIST—*Yale & Towne Mfg Co, Philadelphia 15, Pa.* Cable King electric hoists are designed for top mounting in double-girder bridge cranes. Units, available in capacities of from 1 to 15 tons, have triple-reduction spur-geared drive, totally-enclosed, fan-cooled motor, rugged heavy steel suspension frame, and pushbutton-operated heavy-duty contractor.

AIR HOISTS—*Keller Tool Co, Grand Haven, Mich.* A 1000-lb capacity unit weighs only 30 lb; safety hooks are now standard equipment for load hook and optional for suspension hook; improved lubrication system; an extra bearing has been added to the motor drive shaft; ring gears hardened for longer wear.

ELECTRIC CHAIN HOIST—*Chisholm-Moore Hoist Corp, Tonawanda, N Y.* Model is available in capacities from 250 to 2,000 lb plug-in operation from any single-phase lighting circuit, 220 or 440 v power line. Regardless of voltage used, no more than 110 v passes through control station.

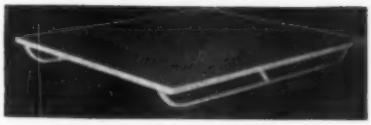


HYDRAULIC LIFT—*The Lange Lift Co, 102 W Fowler St, Milwaukee 3, Wis.* Vertical hydraulic lift may be placed directly on or bolted to the floor, or mounted on wheels. When floor mounted, the 24x60-in. platform is 7½ in. above the floor in lower position and 30 in. in raised position.

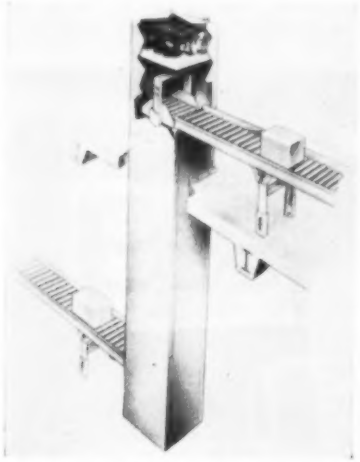
DIE HANDLER—*Hansford Mfg Corp, 1239 University Ave, Rochester 7, NY.* It will handle dies up to 23 in. wide, 43 in. long, shut height from 9 to 14 in., and weighing up to one ton. The upper platen has a 20x42 in. area and vertical travel of 16½ in. and can be rotated 360°.

END-MOUNTED VIBRATOR—*Cannon Vibrator Co, 1111 Power Ave, Cleveland 14, Ohio.* The EM-5-QH vibrator weighs 180 lb with a 55-lb piston. Stroke is 1⅝ in. at a rate of 650 strokes per min, and an operating pressure of 80 psi.

PLASTIC TOTE-BOXES — *Tewes-Roedel Plastics Corp, Waukesha, Wis.* Tew-Roe-Totes, made of copolymer sheeting, are lightweight and resistant to common acids, oils, and greases.

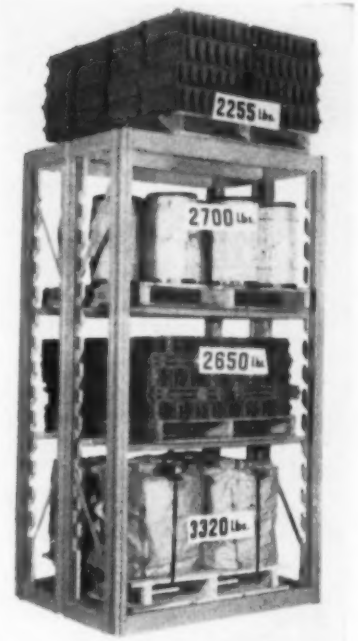


TUBULAR STEEL PALLETS—*Econoweld Co, 1805 Webster St, Dayton, Ohio.* Lighter than wood pallets of the same dimensions and load capacity. Tubular skid runners are welded to an angle-iron frame which supports the laminated wood deck.



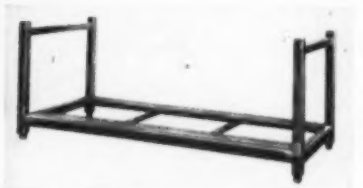
RECIPROCATING LIFT — *Conveyor Specialty Co, Inc, North Quincy 71, Mass.* This unit is primarily designed for automatic loading and unloading of articles between two points, but not at any intermediate points, neither can it be used for loading and unloading in both directions with automatic features. Depending upon the article, the conveyor can be designed to handle up to 1000-lb loads.

RACK FRAMING — *Multi-A-Frame Div, Ainsworth Mfg Corp, Detroit, Mich.* Multi-A-Frame consists of three basic units with which materials-handling racks and other equipment can be built that at any time may be dismantled, adapted, or converted—without scrapping. The three basic units are: channel frame, a spring T-bolt, and a lock-fitting.



PALLET RACK—*Berger Manufacturing Div, Republic Steel Corp, Canton, Ohio.* The Berger pallet rack is a tailor-made unit designed to the specifications of the user's pallets. The rack has maximum dimensions of 60x60x120 in. and can be furnished with extra-heavy tubular supports or solid shelves.

DROP-BOTTOM CONTAINER — *Roura Iron Works, Inc, 1401 Woodland Ave, Detroit 11, Mich.* These drop-bottom containers operate with a positive counterweight handle. Sides are 12-gage, reinforced with 2-in. channels and welded throughout. The drop bottom opening is 13 in. high x 31½ in. wide.



COLLAPSIBLE STOCK RACK — *Equipment Mfg Inc, Detroit, Mich.* This collapsible stock rack, with no detached or loose parts, is designed so that a solid floor can be laid for the handling of bulk goods.

PORTABLE ELEVATOR — *Barrett-Cravens Co, 4609 S Western Blvd, Chicago 9, Ill.* Use of air power in this portable elevator means greater safety especially in hazardous locations, such as dusty and explosive-vapor areas. It is powered by an Ingersoll-Rand air-motor hoist, operating from a compressor.

SCRAP BOX — *Equipment Mfg Inc, 21550 Hoover Rd, Detroit 5, Mich.* Scrap box is made of corrugated steel and has a yoke for handling by crane or hoist. Standard size is 36x42x30 in. deep with a capacity of 32 cu ft.

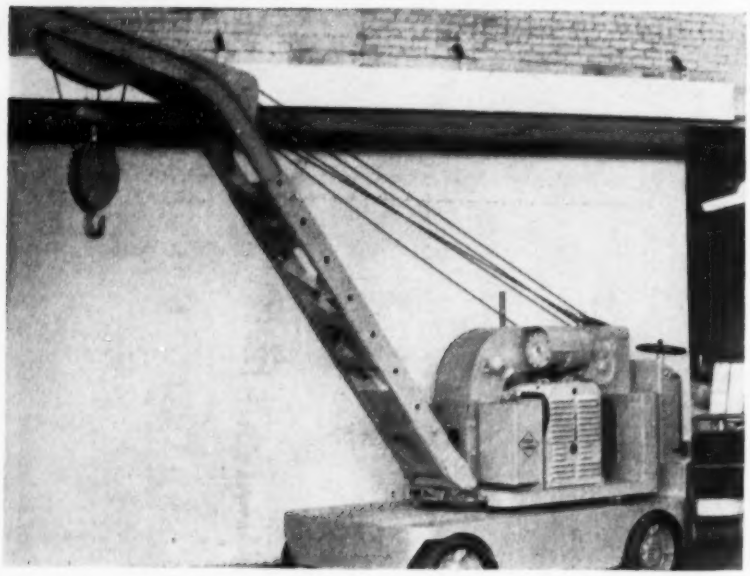
PARTS BIN — *Stackbin Corp, 1139 Main St, Pawtucket, R I.* This hooded bin is designed to protect small parts and materials from dust and to permit handling without spilling the contents. Standard sizes range from 3½x6x3¼ to 15x24x11 in.

INDUSTRIAL DUST PAN — *Palmer-Shile Co, 16019 Fullerton, Detroit 27, Mich.* Is on wheels to facilitate the removal of debris. It is of light-weight all-welded construction and weighs only 45 lb. Metal pan measures 18x18x18 in.

COMBINATION RACK AND BOX—*American Sales Engineers, 141 W Eight Mile Rd, Detroit 3, Mich.* The rack is made for handling miscellaneous products and has the following tiering feature—tubular corner posts and deep-drawn nesting caps on each leg.

POSITIONER—*Mefco Sales & Service Corp, Glendale, Calif.* Hydra-Set is a hydraulic load-weight actuated, cylinder-and-piston device for positioning and weighing of hoist loads. Upper eye of the unit is hooked onto the crane or hoist lifting line, and the load is hooked to the lower eye. 20-ton capacity model weighs 65 lb.

BOX—*Aluminum Co of America, 801 Gulf Bldg, Pittsburgh 19, Pa.* All-aluminum materials handling box, measuring 60 x 42 x 36 in., can be used for handling finished products or as a scrap box. Mounted on low runners, they may be lifted by fork trucks and carried, stacked, or turned over for dumping. The 245-lb. box will carry a 5,000-lb. load.



ELECTRIC-POWERED, MOBILE CRANE—*The Elwell-Parker Electric Co, 4205 St Clair Ave, Cleveland, Ohio.* Known as Model CZ has an extra-wide bed and good forward visibility. Capacity is 10,000 lb at 5½-ft radius. With boom fully extended to 19 ft, a hook height of 18 ft can be obtained.

COIL-STOCK CRADLE — *Rowe Machinery & Mfg Co, 1506 N Industrial Blvd, Dallas, Texas.* Takes stock with a max. OD of 48 in. and max. width of 15 in. as standard. Capacity is 3000 lb. Actuating arm operates on the inside or outside of the slack loop. Hardened and ground rolls are mounted in each of the two individually controlled guide plates.

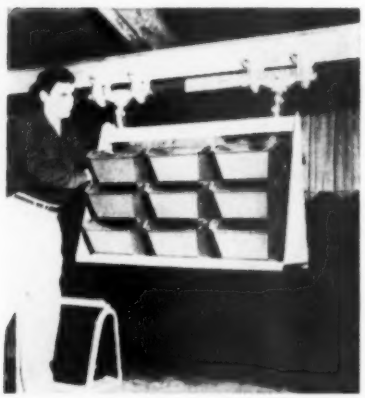
→

AUTOMATIC SHEET SELECTOR — *The Union Tool Corp, Warsaw, Ind.* This unit can be used both as a sheet selector and as a sheet stacker. It can be used at an inspection point to sort reject sheet from acceptable sheets during processing, or as an automatic sheet stacker by placing or taking off the sheets on a lift conveyor.

CRANE—*Lempco Products Inc, Bedford, Ohio.* The Series-TM portable cranes have an all-welded girder construction with square instead of tubular members, and weighs somewhat less than its predecessor. It is operated by a hand pump.

COIL GRABS—*Dixon Automatic Tool, Inc, 2300 23rd Ave, Rockford, Ill.* Two 5000-lb capacity coil grabs are available, one for normal width coils up to 12 in. wide, the second up to 24 in. Available in 2000 and 5000-lb sizes.

LOADER — *Efficient Equipment Inc, 1621 W Hastings St, Chicago 8, Ill.* Transforms a standard dump truck into an all-purpose unit that can do the work of several machines. It is adjustable to any size dump truck, consists of an attachable shovel or magnet, arms, and hydraulic equipment.



MATERIALS-HANDLING SYSTEM — *Charles William Doepke Mfg Co, Rossmoyne, Ohio.* Basis of this system are two hoppers, called NesTiers. A single-unit dolly is designed to convey loaded hoppers from machine to machine. A caster truck will hold four stacks of hoppers. A rack can be used by lift trucks. A conveyor tray is designed for overhead monorail systems.

CENTERING REELS—*F J Littell Machine Co, 4105 Ravenswood Ave, Chicago 13, Ill.* These reels have arms which are contracted by means of hydraulically actuated cams within the spindle. As the sleeve is pulled toward the frame, the arms spread until the coil is gripped tightly. The reels are available in 5-, 10- and 20-ton capacities.

COPYING MACHINE—*Charles Bruning Co, Inc, Teterboro, N J.* has a 46-in. printing width to handle standard 42-in. roll stock or insertion of multiple cut sheets of copying paper. Its 48-in., 2,000-watt Vycor mercury arc lamp speeds printing up to a maximum of 12 linear fpm.

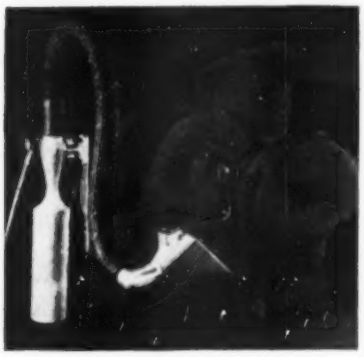
PHOTOCOPYING METHOD—*American Photocopy Equipment Co, 2849 N Clark St, Chicago 14, Ill.* Based on a new principle of instant and automatically developing and fixing. It is said to enable anyone without training or special skill to produce clear black-and-white photo-exact copies of any original in any office.

COPYING MACHINE—*Charles Bruning Co, Inc, Teterboro, NJ.* Desk-side machine which copies any size office form in seconds. 20-in. width enables large statistical sheets to be reproduced, or ordinary letter-size forms two at a time. Unit, which requires no masters, inks, tray developing, special lighting, exhaust ducts, or installation, takes up less than a sq yd of floor space. It works on a standard 115-v, 60-cycle, ac power circuit.

COPYFIX — *Remington Rand, 315 Fourth Ave, New York, NY.* A process for making photo-exact, positive copies of any record, regardless of type or color, reproduces records from originals up to 14 in. wide in any length. Operates from any electrical outlet.

DRAFTING-MACHINE SCALES — *Universal Drafting Machine Corp, 7960 Lorain Ave, Cleveland, Ohio.* A line of metal drafting-machine scales, called Duraline, have twelve standard types of graduations available in 6, 12, 18, and 24 in. lengths.

DUST COLLECTOR—*Aget-Detroit Co, 130 Main St, Ann Arbor, Mich.* This collector, Model 30-50, has a rated capacity of 36-30 cu ft of air per minute, at a static suction of 6 in. measured on an 8-in. inlet pipe.



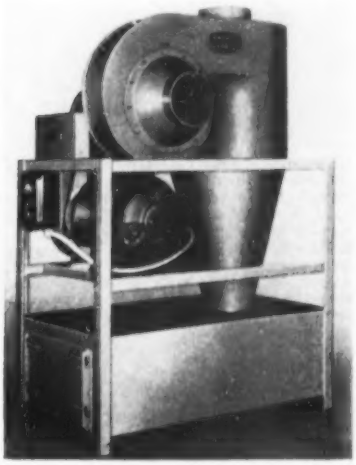
DUST-COLLECTOR—*The Vulcan Tool Co, 730 Lorain Ave, Dayton 10, Ohio.* Compact units for collecting grinding dust have no moving parts and operate from factory air supply. Available in two sizes: 200 Series with 24-cu-in. capacity for grinding wheels 2 in. in dia or under and the 700 Series with 56-cu-in. capacity for grinding wheels 7 in. in dia and under.

DUST COLLECTOR—*Aget-Detroit Co, 130 Main St, Ann Arbor, Mich.* Model 20ND30 Dustkop is available for use on 25-cycle power. It is designed for the exhaust of air that has been cleaned of industrial dust, but which still contains toxic fumes. Capacity of unit shows 2450 cfm on a single 6-in inlet with a 4.5-in. static suction.

DUST COLLECTOR—*Aget-Detroit Co, 130 Main St, Ann Arbor, Mich.* Model JS dustbuster has a 1/3-hp continuous-duty motor mounted on a cabinet that encloses a caster-mounted, heavy-duty trash can of 31-gal. capacity. Cabinet frame acts as both a support and shaker for the cloth filter.

DUST COLLECTOR—*Aget-Detroit Co, Ann Arbor, Mich.* The Model 520 Dustkop requires only 18x23-in. floor space and 25-in. over-all height, yet develops a rated 525 cfm at a static suction of 2-in. water lift.

VACUUM PRINTING FRAME—*Muller-Trojan Co, Inc, 1083 W Main St, Troy, Ohio.* For producing photographic metal templets, it eliminates the laying out of the design on the templet by hand. Continuous operation is possible with no over-heating of the machine. Over-all printing area of the machine is 60 x 144 in.

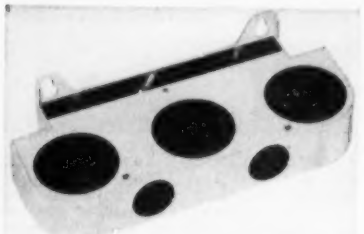


DUST COLLECTOR—*Aget-Detroit Co, 130 Main St, Ann Arbor, Mich.* Model 30ND50 Dustkop dust collector provides for outside exhaust of cleaned air, together with an overdrive when used on electric power having frequencies of less than 60 cycles. The unit has a rated capacity of 3630 cfm at 6-in. static suction on an 8-in.-dia pipe.

DUST COLLECTOR—*Aget-Detroit Co, Ann Arbor, Mich.* Collector develops a rated 5500 cfm at 4 in. of water on a 12-in. inlet and yet is available from stock as a complete unit with motor-driven fan, cyclone separator, and dust-storage compartment.

PORTABLE CIRCUIT EXTENSION—*National Electric Products Corp, Pittsburgh 19, Pa.* Known as NE Rolla-Duct, the unit provides a power and light head, a lighting head with four sockets, or a four-socket infra-red spreader. The carriage-mounted units carry an approved rating for 20-amp loads for 115- or 120-v operation.

MONOCHROMATIC LIGHT — *DoAll Co, 254 N Laurel Ave, Des Plaines, Ill.* Called Monolight, the monochromatic light is a self-contained unit in a light rigid-cast aluminum body having a 5x5½-in. high-intensity heliumtube light source providing 53-ft candle power on the testing stage. Standard stage is a 6⅛ in. x 4⅛-in. phenolic plate.

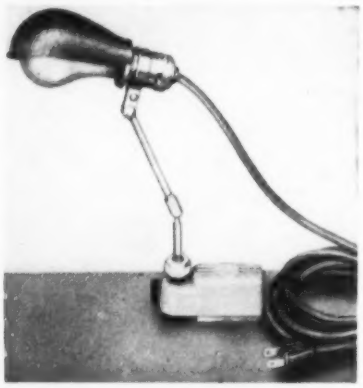


FLUORESCENT LAMPHOLDERS — *Lighting Div, Sylvania Electric Products, Inc, 500 Fifth Ave, New York 18, NY.* A line of turret-type lampholders for single pin and bi-pin fluorescent lamps in two- and three-lamp combinations are available. The line includes five styles of single pin and three bi-pin holders. The bi-pin holders have coil springs in line with the axis of the lamp to eliminate vibration.

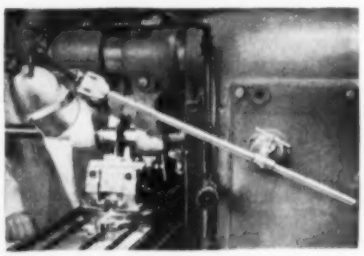
LIGHT—*Westinghouse Electric Corp, P O Box 2099, Pittsburgh 30, Pa.* A shallow surface luminaire, 3 5/16 in. deep, is available in 4, 6 or 8-ft. lengths and two and four lamp widths, and can be used with a variety of slimline and standard fluorescent lamps. Recommended for low ceiling areas, it may be mounted in rows or individually.

LIGHT—*Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* SDP luminaire is equipped with an upward component which distributes 23% of the light toward the ceiling. Uses two slimline lamps of 38, 58, or 75 watts each.

WORK LAMP—*Lindly & Co, 248 Hercricks Rd, Mineola, L I, N Y.* A specially designed reflector, controlled by fingertip manipulation of a plastic ring, increases intensity of the bright center up to four times original brightness.

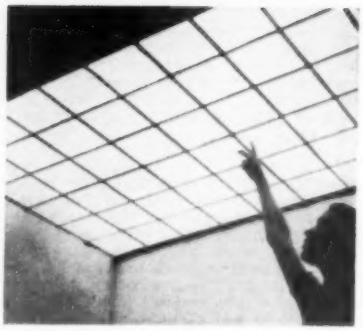


LIGHTING UNIT—*ENCO Mfg Co, 4525 W Fullerton Ave, Chicago 39, Ill.* Portable magnetic-base lighting unit holds up to 100-watt standard incandescent bulb to curved or flat surfaces. Base size is 1 x 1⅝ x 4 in. Magnetic pull is 100 lb. A fingertip lever release magnet for removal or repositioning.



MACHINE LAMP—*Bretford Manufacturing Inc, Franklin Park, Ill.* Textolite bearings and an oil-resistant cord with added Vinylite insulation is used on this machine lamp to prevent oil damage. Standard 40- and 60-watt bulbs or 75-watt reflector bulbs may be used.

TRACING TABLE—*Stacor Equipment Co, 473 Troy Ave, Brooklyn 3, N Y.* A fluorescent reflector and a glass surface sandblasted underneath for diffused lighting. Two adjusting devices raise and lower the tracing surface to a comfortable working angle.



LUMINOUS—*Sylvania Electric Products, Inc, 60 Boston St, Salem, Mass.* Luminous ceiling is a panel of glass, treated to make one side electrically conductive, coated with light-producing phosphor disbursed in a dielectric material, and then backed by a metallic coating.

LIGHTING PANELETTES—*Square D Co, 660 Rivard St, Detroit 11, Mich.* Available with either lugs or circuit breaker mains from 2 to to 40 circuits for use on ac lighting and appliance branch-circuit applications.

CONCRETE FLOOR HARDENER—*The Monroe Co, Inc, 10703 Quebec Ave, Cleveland 6, Ohio.* No. 860 is reported to change the chemical structure of concrete, forming a dense, non-porous, flint-like surface which retards dusting and rusting, even under the heaviest traffic.

FLOOR-MARKING MACHINE—*H C Sweet Co, 12083 Woodbine Ave, Detroit 28, Mich.* Said to make it possible to mark safety and parking lines within ⅛ in. of obstruction. The unit can be operated by one man using one hand to guide and control it.

FLOORING MATERIAL — *Roc-Wood Flooring, 36½ E 23rd St, Chicago 16, Ill.* Called Roc-Wood, it is composed of hardwood fibers chemically treated and bonded together with a plastic binder.

FLOOR RESURFACING — *The Monroe Co, Inc, 10703 Quebec Ave, Cleveland 6, Ohio.* Steelhard is made of extra-tough resins and non-stone aggregates. These permit a hard, tough, resilient surface.

RUBBER FLOOR MAT—*U S Rubber Co, Rockefeller Center, New York 20, N Y.* With a built-in radiant-heating unit it operates on 110-v current. Normal operating temp for the heater is about 35 F above surrounding temp. Rubber used is especially constructed for toughness.

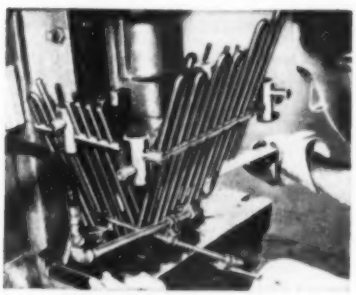
MECHANICAL SWEEPER — *Handling Devices Co Inc, 581 Boylston St, Boston 8, Mass.* Can clean from 15,000 to 22,000 sq. ft. an hour and simultaneously collect debris from paper to coke bottles. Optical side brushes which attach to either the 20- or 28-in. model add 6 in. to the sweeping area.

FLOOR-PATCHING MATERIAL — *Permamix Corp, 228 N La Salle St, Chicago, Ill.* Called Permamix can be used on any flooring and is ready for use just as it comes from the container. It is said to set instantly, so that traffic can be resumed immediately.

ILLUMINATED MAGNIFIER — *Stocker & Yale, Inc, Marblehead, Mass.* Portable fluorescent fixture designed primarily for industrial inspection, produces intense but cool glare-free illumination with high magnification. Model 66SV is equipped with either a 2- or 4-power lens of 2x4-in. dimensions. Lens holder is hinged, offering the inspector complete versatility of using the light with or without the lens.

PACKAGING — *Gaylord Container Corp, 111 N Fourth St, St. Louis 2, Mo.* New method is to build a solid fiber container which completely encloses the lathe, with wooden skid on bottom. Stapling hammer is used to attach six pieces of 0.1 in. solid fiber to skid and frame.

ALARM UNITS — *Tigerman-Anderson Co, 4332 N Western Ave, Chicago, Ill.* Automatic alarm units for remote signalling of failure or other-than-normal operation permit a variety of circuit arrangements. Unit has a switchboard circuit header wired into the basic relay in different ways, depending on circuit desired. Hermetically sealed Tel-Alarms are self-contained.



SAFETY GUARD—*Searjeant Metal Products, Inc, Mendon, N Y.* Front and side barriers of this basket enclosure guard for all types of punch presses can be tilted in or out, as required. Vertical rods can be adjusted up or down to clear the die straps, air nozzles, etc. Entire front barrier can be tilted up or taken off quickly to remove double or damaged blanks from the die.

PLASTIC MASK—*General Scientific Equipment Co, 2700 W Huntingdon St, Philadelphia 32, Pa.* Lightweight Lumarith mask and cotton gauze filter protects nose, lungs, face, and eyes against dusts, chips, and particles in all types of light, non-toxic work. GS No. 84 mask and shield retails for $7.80 per doz; extra filters are available at $2 per hundred.

EAR PROTECTOR—*Sigma Engineering Co, 1491 N Vine St, Los Angeles 28, Calif.* Sonic Ear-Valv is a device which acts as a protective ear drum by removing harmful effects of loud noise while allowing the ear canal to remain open to receive air and permit hearing of ordinary voice level sounds. The product is not an ear plug, but a small sonic filter of many precision parts.

WORK GLOVE—*Regal Textile Corp, PO Box 170, Grand Central Station, New York 17, N Y.* U S Testing Co. reports Plastic-Dot fabric outlasted 10-oz canton flannel fabric by over two-to-one. Cost only slightly more than ordinary 10-oz canton flannel gloves.

HAIR-NET VISOR — *General Scientific Equipment Co, 2700 W Huntingdon St, Philadelphia 32, Pa.* Protects women workers against hazards of machinery. A full, wide back permits easy and complete coverage of the hair. It is adjustable to all head sizes.

FINGER BUFF—*George R Churchill Co, 7501 Fayette St, North Quincy 71, Mass.* P-30 is for hand or machine operation. Pleated construction of each finger traps and holds cutting compounds for all polishing and buffing requirements. Produced in all types of cloth, and in all sizes from 6 in. to 18 in. dias.

WORK CLOTHES—*Mine Safety Appliances Co, Braddock, Thomas and Meade Sts, Pittsburgh 8, Pa.* MSA Chem-Klos, include shirts, trousers, and coveralls especially suited to jobs involving use of acids or caustics; fabric resists corrosive chemicals, as well as wear, moths, mildew, shrinkage, snapping and tearing.

SAFETY GLOVES — *Boss Mfg Co, Kewanee, Ill.* Boss Ball-Tip safety gloves are available in two styles: No. 1501 with a 5-in. gauntlet cuff, and No. 1502 with a 2½-in. safety cuff. Steel balls of ⅝-in. dia are securely stitched into ends of all-leather fingers, cut extra long for adequate room.

FACESHIELD — *Mine Safety Appliance Co, Braddock and Meade Sts, Pittsburgh 8, Pa.* Improved vision, elimination of dead-air space, and no uncomfortable head straps are some of the advantages of this faceshield.

MAGNETIC GRIP SHIELD—*Dilley Mfg Co, 1626 Ansel Rd, Cleveland, Ohio.* For use as a safety guard; composed of a sheet of transparent, shatter-resistant Plexiglas, ⅛-in. thick, and a permanent magnet to which the plastic is swivel-mounted. Magnet holds guard securely in any position on a machine base.

LIGHT-WEIGHT FACESHIELD — *United States Safety Service Co, 1215 McGee St, Kansas City 6, Mo.* Uses cellulose-acetate-butyrate materials in the headgear. The plastic spark protector is green which eliminates glare from overhead lighting.

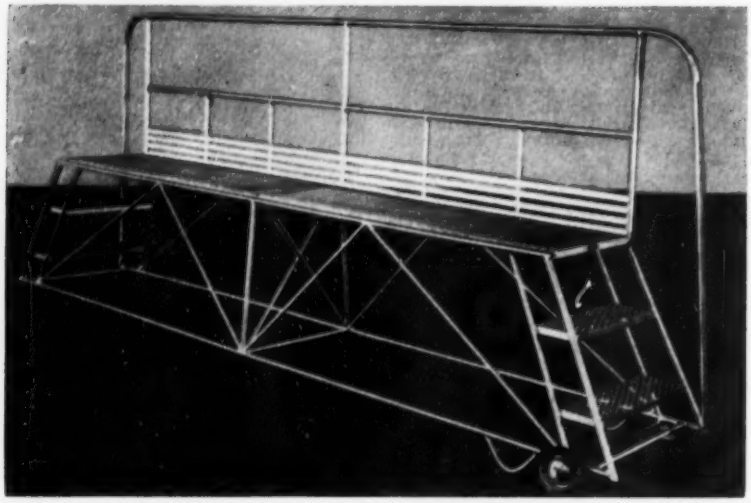
SAFETY GOGGLES — *Pennsylvania Optical Co, Reading, Pa.* 220 Series provides unobstructed side vision by placing temples above the line of sight. Bridge is strengthened by joining eye wires at four points to distribute evenly any stress over a wide area. Available with curved or flat standard 47 mm or 44 mm clear or absorptive safety lenses.

MAGNIFYING SPECTACLES—*Armco Mercantile Co, 221 N LaSalle St, Chicago 1, Ill.* Optical system of binoculars or telescope affords 2x magnification. Viewing field is observed at a normal reading distance. Can be worn over regular glasses.

FIRE EXTINGUISHER—*General Detroit Corp, 2272 E Jefferson Ave, Detroit 7 Mich.* With one-quart capacity, is said to remain free from corrosion by the use of a corrosion arrestor which purifies the liquid.

FIRE EXTINGUISHER — *Ansul Chemical Co, Marinette, Wis.* Extinguisher expels a dry powder known as Met-L-X that is said to be effective against fires in magnesium, potassium, sodium, zinc, powdered aluminum, and other metals.

PACKAGED CO_2 SYSTEM — *Walter Kidde & Co, Inc, 40 E 34th St, New York 16, N Y.* Package contains temperature-rate-of-rise detectors, tubing, automatic control heads, discharge heads, Multijet nozzles, and a cylinder-supporting frame. Cylinders are shipped separately.



PORTABLE PLATFORM—*Ballymore Co, Wayne, Pa.* For assembling large machinery and machine tools, army tank turrets and guns, etc. Built to meet specific requirements for length, height, width, and rail construction. Features are: all-steel welded tubing, expanded-metal treads and platform, and ample space for both tools and workers.

WORKTABLE — *Westinghouse Electric Corp, PO Box 2099, Pittsburgh 30, Pa.* Designed to accommodate a wide variety of equipment; it incorporates control circuits necessary for automatic or semi-automatic induction heating operations. Quench plumbing is built into table, together with automatic control valves. Only necessary installation connections are water supply and drain.

WORK BENCHES—*Sturdi-Bilt Steel Products, Inc, 624 S Michigan Ave, Chicago 5, Ill.* Feature heavy rolled-steel frame construction and legs tension bolted to frame to insure rigidity. The tables are available in two sizes 23 x 46½-in. top, 33½-in. high; 23 x 60-in. top, 33½-in. high.

WORK BENCH — *Sturdi-Bilt Products, Inc, 624 S Michigan Ave, Chicago 5, Ill.* Shop Tender is available for handling set-up tools beside drill presses, lathes, grinders, etc. Height of work surface can be adjusted through nine positions from 21½ in. to 34½ in.

STEEL STORAGE FILES—*Equipto Div, Aurora Equipment Co, Aurora, Ill.* 3 ft wide, 7 or 10 ft high, large choice of depths. Shelves adjust vertically on 1½-in. centers. Assembly is flexible and may be added to. A 24-in aisle space is adequate.

SOLVENT HAND CLEANER — *Khemo-Klean Co, 3265 S 9th East St, Salt Lake City, Utah.* Rubbed on until it liquefies, can be rinsed off with water or wiped off with a rag or paper towel. Khemo-Klean is said to provide 400 washings in a 2-lb can; does not contain gasoline, ammonia, or harsh abrasives.

SAFETY GOGGLE — *American Optical Co, Southbridge, Mass.* Transparent plastic frame provides a wide field of vision, can be worn directly over the eyes or over spectacles.

PERMANENT MAGNETS—*Carboloy Dept, General Electric Co, Detroit 32, Mich.* "You-Try-It" kit of permanent magnets provides sample for experimental purposes. Packages No. 1 contains 48 permanent magnets in eight styles with up to 2 lb. pull each. Package No. 2 contains 18 larger magnets in four styles with pull from 3 to 12 lb.

DESK CALCULATOR—*Curta Calculator Co, 5543 S Ashland Ave, Chicago, Ill.* The Curta Swiss-made calculator will add, subtract, multiply, divide, figure square roots, factors, cubes, and percentages—to five decimal places. Weight is 8 oz.

PARTS CABINET—*Bay Metal Products, 3009 N 16th St, Philadelphia 32, Pa.* For use on benches, counters, and shelves. Slots on one-inch centers in drawers permit quick rearrangement for accommodating various parts quantities.

THREAD PROTECTORS — *Precision Paper Tube Co, 2035 W Charleston St, Chicago 47, Ill.* Safeguard external and internal threads and surfaces on machined parts against damage, and act as an efficient seal against dust, dirt, grit, or rust. Made of Kraft, fish paper, cellulose acetate or combination, they are acid-free and non-corrosive.

PLASTIC MARKING TAPE—*Labelon Tape Co, Inc, 450 Atlantic Ave, Rochester 9, N Y.* Can be used for checking fluorescent tube life. The pressure-sensitive product sticks without moistening to any clean, smooth surface. Any pointed instrument can be used for impressions. Transparent plastic outer layer beneath which writing appears protects against dirt, moisture, acid, and smudding.

IDENTIFICATION PHOTOS—*Anderson & Sons, Inc, Westfield, Mass.* Made with a Polaroid Land camera equipped with an adapter for personnel work can be incorporated into duplicate badges in a minute and a half with Badge Master hand press. Serial Numbers can be impressed at the same time.

ACOUSTICAL BABBLES — *Owens-Corning Fiberglas Corp, Toledo 1, Ohio.* Made of a rigid panel of fiberglas PF insulation, measuring 24x48 in. and 1½ in. thick. They are enclosed in a printed plastic film.

MACHINERY LEVELER — *Filter & Injector Co, 1001 S Broadway, Springfield, Mo.* Lev-ler is available in 6-in. size with lifting capacity of approximately 3 tons, and 8-in. size with 5-ton lifting capacity, it is self-locking under load.

WATER-EMULSION ADHESIVES—*Paisley Products, Inc, 1770 Canalport Ave, Chicago 16, Ill.* Developed for application to seams in the manufacture and final closure of waterproof paper bags, wraps, and case liners. It can be applied by machine or by hand brushing.

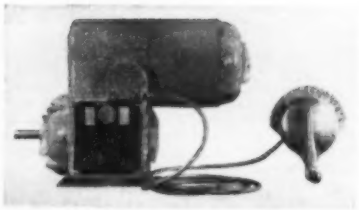
LABELING TAPE—*Tapemark Co, 321 Cedar St, St Paul, Minn.* For shelves, bottles, trays, and the like has top layer of acetate film, under which is pressure-sensitive material that can be scribed by typewriter or blunt marker.

WRITING SLIDE RULE—*The Device Development Co, 226 W 4th St, New York 14, N Y.* Writes in a choice of two colors and also magnifies. The device is 6½ in. long, weighs only 0.8 oz.

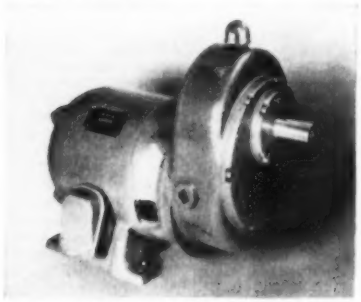
TAPE—*Minnesota Mining & Mfg Co, 900 Fauquier St, St Paul 6 Minn.* Scotch masking tape No. 280 can be used to protect templates during drilling. 6-in.-wide strips are applied solidly across the multi-holed top surface of each template, and rubbed with a colored crayon to outline holes underneath. While holes are bored in the steel plate below the template, the resulting chips and slivers collect on the taped surface, and are merely brushed away before the next hole is drilled.

1953 American Machinist Production Preview

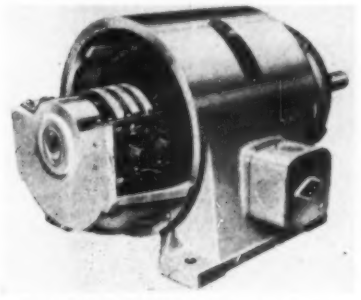
PARTS AND MATERIALS



VARIABLE SPEED MOTORS—*US Electrical Motors, Inc, Box 2058, Los Angeles 54, Calif.* Lightweight Varidrive motor, Type 5VA, is equipped with a control handwheel with indicator dial and a 5-ft flexible cable, enabling operator to control speed at a distance from motor. Unit is available in ¼, 1/3, ½, and ¾ hp, and in a speed ratio up to 10 to 1 over a range of 4 to 10,000 rpm.

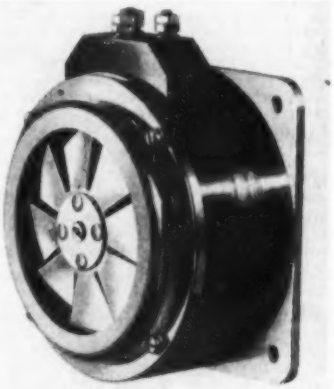


GEARMOTOR — *Westinghouse Electric Corp, PO Box 2099, Pittsburgh 30, Pa.* Lifeline single-reduction gearmotor, Type B, meets the mounting limitation requirements peculiar to side entry agitators and mixers. Designed for light duty coupled service applications, such as fins and pumps, the unit is available in ratings from 1 to 30 hp, 780 to 420 rpm, AGMA classes I and II.



SLIP-RING MOTOR—*Reuland Electric Co, Alhambra, Calif.* For cranes, fans, printing presses, crushers and other applications where variable speed or high starting torque on low starting current is required. The line features a new arrangement of the collector rings and brush assembly which permits their complete housing in the motor's regular end bell.

MOTOR—*The Reliance Electric & Engineering Co, 1088 Ivanhoe Road, Cleveland 10, Ohio.* Totally enclosed dual-cooled motor is equipped with a heat exchanger as an integral part of its frame. A 1½-hp, three-phase, 60-cycle motor built into the heat exchanger runs at 3600 rpm to drive internal and external fans independent of the main motor.



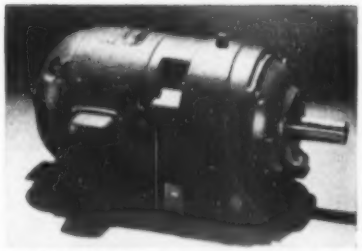
MOTOR—*Allis-Chalmers Mfg Co, Milwaukee 1, Wis.* This motor, operating on the reluctance principle, can be built to operate continuously at any voltage below 250 v, either single or polyphase. A typical unit is 4 in. in dia by 2⅝ in. long, weighs 2.6 lb, and develops 8 ounce-in. starting torque and 0.8 ounce-in. synchronous torque.

WORM-GEAR MOTOR—*US Electrical Motors, Inc, PO Box 2058, Los Angeles 54, Calif.* Type-GW low-speed, right-angle worm-gear motor has a cantilever design to protect gear alignment. Speed ranges from 20 to 155 rpm and gear ratios up to 58:1. Horsepower ranges from ¼ to 3.

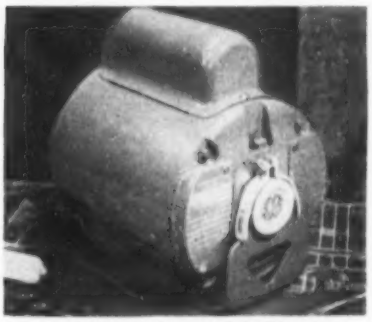
TIMING MOTOR—*A W Haydon Co, Div of N A Phillips Co, Inc, Waterbury, Conn.* Developed as a result of the increased use of 400-cycle power in guided missiles and aircraft, this synchronous ac timing motor is for use where lightweight, accuracy and dependability are required.

MOTOR—*The Reliance Electric & Engineering Co, 1088 Ivanhoe Road, Cleveland 10, Ohio.* Motor makes use of two electronic circuits to briefly impose several times normal voltage on both armature and field. Controlled within predetermined current limits, these forcing circuits make it possible, while maintaining max torque, to reverse the motor more rapidly than has heretofore been done.

MOTOR—*Reuland Electric Co, Alhambra, Calif.* Wafer motor is for applications requiring a totally enclosed, air-cooled unit with a flat design. It is available in ratings from 1/20th through 5 hp, and in speeds from 450 to 3600 rpm, single phase or polyphase.



GEAR MOTOR—*General Electric Co, Schenectady 5, N Y.* Three-piece unit designed to simplify maintenance in case of electrical failure of the stator. Consists of a Tri-Clad motor, a planetary gear, and a mechanical adapter. Gear is available in speed ratings of 780 to 13.5 rpm. Stator can be changed with the removal of the only bearing-enclosure screws, bolts holding the front end shield to the stator, and bolts holding stator to the motor adapter.



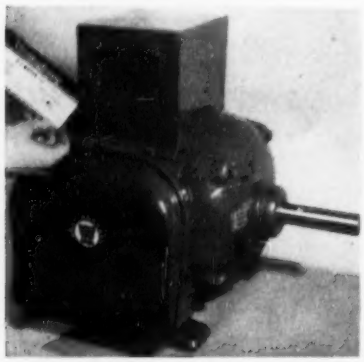
FRACTIONAL-HP MOTORS—*General Electric Co, Schenectady 5, N Y.* Designated as Form G, the new motor weighs as much as 51% less per hp than the model it replaces, and is considerably less bulky. In addition, its versatility has been broadened, and appearance modernized.

TRANSMISSION—*Graham Transmissions, Inc, 3754 N Holton St, Milwaukee, Wis.* A built-in brake motor for use with Graham transmissions provides for immediate stops required in indexing and positioning work. The transmission in sizes from ⅛ to 3 hp, is available with or without built-in reduction of worm or helical spur types.

GEAR MOTOR—*General Electric Co, Schenectady, N Y.* Equipped with a stator that can be removed and replaced in half the time formerly necessary, KRX totally-enclosed, high-torque, high-slip punch-press motor has an extended bar rotor design which improves cooling.

CONTROLLER — *Electric Regulator Corp, Norwalk, Conn.* Regohm, an electric circuit controller of voltage, current, speed, and servos is now mounted on a new steel chassis. Unit weighs about 2 lbs, complete with plug-in controller; measures 5 x 6 x 3¼ in.

MOTOR—*US Electrical Motors, Inc, Box 2058, Los Angeles 54, Calif.* VA-C Varidrive is a single-phase variable speed motor made in ¼, 1/3, ½, and ¾ hp, using 110 or 220v. Speeds are provided in a 10:1 ratio with the range from 4 to 10,000 rpm.



CAPACITOR MOTOR—*Westinghouse Electric Corp, 306 Fourth Ave, Pittsburgh 30, Pa.* Four-pole, capacitor-start, induction-run motors in the 1-, 1½-, 2- and 3-hp sizes have 10% more starting torque with no increase in starting current. Larger four-pole, single-phase motors of 5 and 7½ hp, now have two capacitors, one for starting and one for running. Both are built as part of the motor.

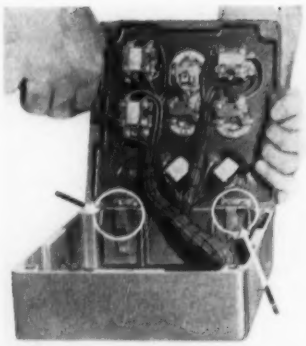
RIGHT-ANGLE GEARMOTOR—*U S Electrical Motors Inc, Box 2058, Terminal Annex, Los Angeles 54, Calif.* The type GW Syncrogear provides a cantilever design to protect gear alignment. Produced in a speed range from 20 to 155 rpm with gear ratios up to 58:1, the Type GW is offered in 3-phase from 1/3 to 3 hp and in single phase from 1/4 to 1 hp.

MOTOR—*U S Electrical Motors Inc 200 E Slauson Ave, Los Angeles 54, Calif.* By the use of two secondary pinions driving the output gear, the effective torque rating of this motor is doubled. Available in 1 to 10 hp with speed ranges of 5 to 25 rpm.

CONTROL FOR DRIVES — *Reeves Pulley Co, Columbus, Ind.* Series-1000 Motodrives are made in 1/3, ¼, ½, and ¾ hp, with speed variations as high as 10 to 1. Consist of the speed varying mechanism, user's choice of standard motor, and a built-in helical-gear speed reducer optional. In addition to mechanical automatic control, units are available with electric remote and handwheel controls.

INDUCTION MOTOR—*General Electric Co, Schenectady 5, N Y.* For acceleration of high-inertia loads such as punch presses, centrifuges, and hoists, this totally-enclosed, fan-cooled high-slip induction motor is said to be 30% smaller and 40% lighter than conventional designs. This is accomplished by the extended-bar design. Type KRX is available in 30 to 150 hp. at 900 and 1200 rpm, 5 to 8 and 8 to 13% slip.

SPEED CONTROL—*General Radio Co, 275 Massachusetts Ave, Cambridge 39, Mass.* Designed for light production work where a ¾-hp motor is used; warm-up time is eliminated because electronic tubes are not used. Instant starting and reversing are provided, together with strong dynamic braking.

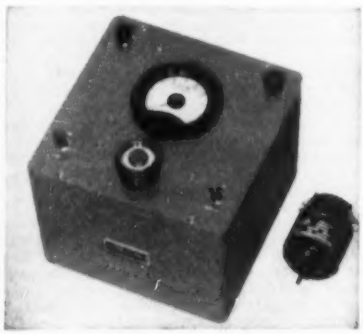


CONTROL STATION—*Square D Co, 4041 N Richards St, Milwaukee, Wis.* Control station in 6, 9, 12, and 16-unit sizes features a hinged cover to facilitate wiring and maintenance. Designed specifically for machine tools, the cast enclosure has a composition gasket between the box and cover to ensure an oil-tight seal.

GEAR DRIVE—*Boston Gear Works, Quincy 71, Mass.* This speed-reducer unit is equipped with a built-in adapter flange for ready installation by direct mounting with 9 screw-feed-conveyor trough.

CONTROL—*Jervis B Webb Co, 8951 Alpine Ave, Detroit 4, Mich.* Flexi-Switch is a mechanically-operated pilot device for controlling relays, motor starters, solenoid valves, and etc. It is suited for operating switches, stops and feeders, automatic transfers and other devices on conveyors. The actuating arm can be set in any one of 72 positions through 360 deg. Arm rotation of only 10 deg. in either direction operates the contacts.

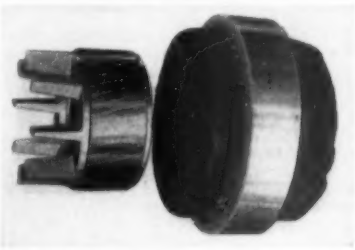
MOTOR — *Robbins & Myers, Inc, Springfield 99, Ohio.* Four sizes to 125 hp supplement R&M's regular line and are designed for all-weather operation, with special treatment to resist moisture and corrosion.



MOTOR CONTROL — *Industrial Control Co, Wyandanch LI, N Y.* Wide range speed and torque generator 302-A consists of a special motor and control box operating from the 117-v, 60-cycle line. Motor speed can be varied from 100 to 10,000 rpm, with a max output torque of 1.0-oz in. and can be controlled remotely, either by a varying dc voltage or a shaft position.

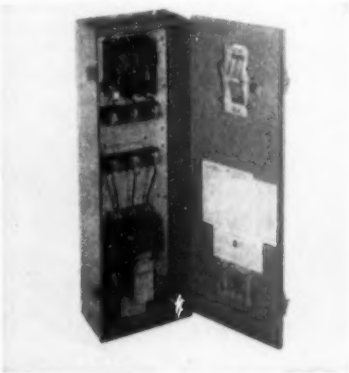
MOTOR CONTROL CENTER—*General Electric Co, Schenectady 5, N Y.* For use wherever two or more ac motors (up to 200 hp, 600v) are controlled from a central location. Provides a simplified method of installing and servicing in a central location ac combination motor starters in NEMA sizes 1 through 5, as well as lighting panels and associated equipment for a group of motors. Withstands short circuit stresses to 25,000 amp.

CONTROLS — *Photoswitch Inc, 77 Broadway, Cambridge 42, Mass.* Photoelectric sets are high-speed controls, particularly recommended for such applications as counting, conveyor control, short-range signal systems, production inspection, and machinery safeguards. Series 20 and 21 have a sensitivity adjustment provided on the control housing to permit positive operation over varying distances.



ROTORS AND STATORS — *Reuland Electric Co, Alhambra, Calif.* Rotors and stators, for housing in frames of user's manufacture, are designed for heavy-duty, long-life. The entire stator is baked into a solid, vibration-proof unit after treatment with a special varnish. The rotor is pressure cast into a one-piece unit.

MOTOR STARTER — *Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* A combination across-the-line motor starter with circuit breaker in which components are mounted side-by-side has been developed for use where this mounting is desired for reasons of space. Available in sizes 0, 1 and 2 in sheet-steel enclosures for NEMA Type 1, 1A and V.



COMBUSTION STARTER — *Westinghouse Electric Corp, Box 2099, Pittsburgh 30, Pa.* Across-the-line motor starters with fusible disconnect switches are available in NEMA sizes 0 through Z. 11-204-N consists of a disconnect switch, main-line fuse clips, and a Life-Line starter mounted in a common enclosure. Available for 3-phase operation up to 600 volts, 60 cycles.

MASTER SWITCH—*General Electric Co, Schenectady 5, N Y.* Adjustable stops provide for any combination of from one to five points of movement of the operating handle in either clockwise or counter-clockwise direction. An open-end wrench is the only tool required to make this adjustment. Standard equipment includes a ball and rod handle, but four other types of operators are also available.

SWITCH—*General Control Co, Boston 34, Mass.* Typical applications for this alternate-contact-operating switch are on machine tools; circuit transfer of timers and recording equipment; in safety circuits; and as a limit switch. Single-pole, double-throw contacts permit adaptation of this switch to either normally closed or normally open circuits.

MERCURY SAFETY SWITCH — *Tigerman Engrg Co, 4332 N Clark St, Chicago 26, Ill.* Mercury switch guarantees positive safety in hazardous, explosive locations. The hermetically-sealed unit, mounted on a lever-operated armature, is actuated by a selector knob or push-button. The totally-mechanical nature of actuating linkage eliminates possibility of a spark. Designed for vertical panel mounting, the switch is a single-pole, with either single or double-throw action.

MU-SWITCH PLUNGERS — *Micro-Switch Div, Minneapolis-Honeywell Regulator Co, Freeport, Ill.* Microswitch has developed the 2ML1 with a straight-plunger actuator, and the 5ML1 with roller-plunger actuator. Underwriters' Laboratories list the switches for 20-amp., 110-, 220-, or 460-volt ac; ½-amp., 115-volt dc; ¼-amp., 230-volt dc; ¾-hp 220-volt ac.

DISCONNECT — *Electric Machinery Mfg Co, Minneapolis, Minn.* A gang-operated disconnect method has been developed for re-energizing fuses on high-voltage motor control. The high-voltage fuse compartment, Sa-Fuse, has a movable panel on which current limiting fuses are gang mounted. Interlocks prevent disconnecting the fuses when the switch is closed.

LIMIT SWITCH—*General Electric Co, Schenectady 5, N Y.* A rotating limit switch for application where reversing operation is to be co-ordinated with the number of revolutions of a motor shaft or drive equipment can be used to control valves on machine tools, travel limits on machinery etc.

LIMIT SWITCH ACTUATORS—*General Control Co, Boston 34, Mass.* The "du-op" limit switch is now available with four additional types of actuators. Type Du-O is operated by a ⅛ in. diameter nylon plunger. Type DU-L is a sensitive leaf actuator requiring light operating pressure. Type DU-B is actuated from the side or any lessen angle by a ball actuator. Type DU-E has a stainless steel plunger and provides for plunger over-travel up to 0.093 in.

ELECTRIC SWITCH — *Micro Switch Div, Minneapolis-Honeywell Regulator Co, Freeport, Ill.* Weighing only 1 oz, is sealed against entrance of oil, water, and dirt by synthetic sponge rubber. Movement required to operate snap-acting switches is provided by resilience of the seal. Single- and double-pole assemblies listed for 5 amps, 250 v ac.

STEPPING SWITCH — *Consolidated Engineering Corp, 300 N Sierra Madre Villa, Pasadena 8, Calif.* Model 2700 Bi-Directional stepping switch is adapted for high-speed, differential counter and servo-mechanism designs. Capable of advancing or reversing with equal speed, it can be used as a differential counter to indicate a remaining quantity or balance on hand.

SWITCH ASSEMBLIES—*Micro Div, Minneapolis-Honeywell Regulator Co, Freeport, Ill.* Primarily designed to meet vibration resistant requirements of air-craft, these assemblies can be applied in any equipment where manual or mechanical multiple circuit control is required. Available with 1 to 10 double-throw switching elements, all operated by a single lever. Each element listed at 10 amp. up to 250 volts ac and will handle 30 volts dc inductive loaded at 10 amp.

ROTATING LIMIT SWITCH—*Furnas Electric Co, 1014 McKee St, Batavia, Ill.* Controls travel of rotating parts of machines or equipment. Coordinates reversing operations with rotation of motor shaft to break contact, timing of which is governed by a preset number of shaft revolutions.

REVERSING DRUM SWITCH — *Square D Co, 4041 N Richards St, Milwaukee 12, Wis.* The Class 2601, Type-A small reversing drum switch features an operating mechanism that is convertible for maintained or spring-return action. Screw-type terminals are provided and terminal blocks with contact fingers are easily replaceable.

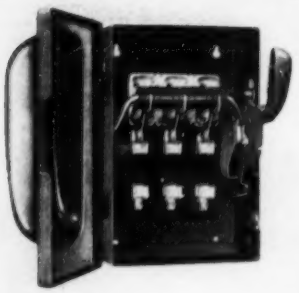
MICRO-SWITCH—*Micro Switch Div, Minneapolis-Honeywell Regulator Co, Freeport, Ill.* This roller snap-action switch designed for cam-actuated service can make or break steady state currents of 20 amps, and handles in-rush currents to 75 amps.

PRECISION SWITCH—*Micro Switch, Div Minneapolis-Honeywell Regulator Co, Freeport, Ill.* Hermetically sealed precision toggle switch designed for aircraft can be used for other applications. Tentative rating: 5 amp motor load 30 v dc, 10 amp inductive load 30 v dc, 25 amp resistive load 30 v dc, 1 amp for any type of load 125 v ac.

OIL-TIGHT PUSHBUTTONS—*General Electric Co, Schenectady 5, N Y.* Oil-tight pushbutton units for machine tools are designed on the building-block principle featuring self-aligning contacts and removable color rings. Only one form of contact block is used in the new units—a single-pole, double-throw made of Melamine.

SNAP-ACTION SWITCH — *Micro Switch, Freeport, Ill.* The electrical rating of the switch is as follows: 10-amp inductive load, or 25-amp resistive load, 28 v dc; 1 amp inductive or resistive load, 125 v ac. The switch can be had with single-pole, single-throw, or double-throw contacts. Operating force is 16 oz; ± 6 oz. Release force is 4 oz min.

ATOMIC-HYDROGEN TRANSFORMER—*General Electric, Schenectady, N Y.* Transformer welder made by GE has been redesigned with: 1) a new hot-start circuit, 2) silicone insulation, 3) extra-wide current range. The current range of 10 to 100 amperes allows the use of one machine on all applications.



SAFETY SWITCHES—*Square D Company, 6060 Rivard St, Detroit 11, Mich.* A complete line of safety switches, in ratings to 2400 amps, 600 v, and 50 hp, meet the recently adopted federal specifications W-S865.

BOURDON-TUBE SWITCH—*Hydro-Aire, Inc, Burbank, Calif.* A bourdon-tube pressure switch for use with air, aircraft fuels, hydraulic fluids, or lubricating oils handles pressure in ranges of from 0 to 1500 psi.

SNAP-ACTION SWITCH—*Micro Switch Div, Minneapolis-Honeywell Regular Co, Freeport, Ill.* Using a "make-before-break" principle, this snap-action switch is said to insure continuity in the operation of an electrically controlled multistage machine.

TOGGLE SWITCHES—*Riverside Manufacturing & Electrical Supply Co, 10228 Michigan Ave, Dearborn, Mich.* The switches are furnished with ratings from 20 to 200 amp., in toggle arrangements of momentary on or off and stationary on or off, with one- or two-hole mounting.

LIMIT SWITCH—*The Exhibit Supply Co, Electro-Snap Div, 4218 West Lake St, Chicago, Ill.* Hermetic sealing with inert atmosphere protects against freezing, corrosion, explosions, accumulation of dust on contacts, tampering, and misadjustments. Imported feature is a tipping diaphragm action to prevent jamming from ice formation.

SOLENOID VALVE—*A-P Controls Corp, 2450 N 32nd St, Milwaukee, Wis.* Model-67 solenoid valve is offered in two body styles and with two types of needle and seat construction. The valve can be used for air, oil, water, gasoline, alcohol, butane, or other non-corrosive liquids or gases. Capacity with water is 78 gph.

SOLENOID VALVE—*Skinner Electric Valve Div, Skinner Chuck Co, Norwalk, Conn.* The Skinner X5 valve is essentially the same as the V5, but with modifications to meet Underwriters Laboratories requirements for Class-I, Group-D explosion-proof construction.

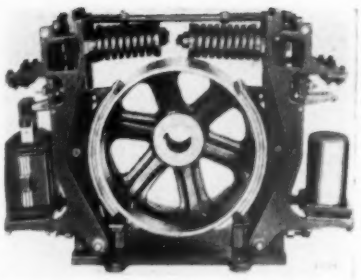
SELENIUM RECTIFIERS — *Rapid Electric Co, 2881 Middletown Road, New York 6, N Y.* For direct current power supply at individual work stations, line of selenium rectifiers includes a 300-watt and a 500-watt unit. They operate from 115-volt 60-cycle lines. They furnish from 90 to 135 volts filtered dc output.

SOLENOID—*Scully Machine Co, 62 Walter St, Bridgeport 8, Conn.* Dual-solenoid unit has a full stroke in either direction of $\frac{7}{8}$-in. With a suitable relay circuit, the unit can be electrically centered giving a two-way action.

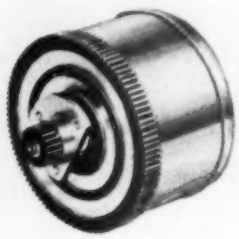
THREE-PHASE WINDING HEAD—*Crown Industrial Products Co, 1057 Park & Borden Aves, Sycamore, Ill.* This three-phase winding head, winds any musy-coil for motors ranging from $\frac{1}{4}$ hp up to and including the General Electric 75-hp three-phase motor.

PORTABLE BATTERY CHARGER—*The Baldor Electric Co, St Louis Mo.* This battery charger weighs only 28 lb, yet charges at a full 80-amp rate, includes ammeter and a time switch which automatically shuts down the fast rate.

MAGNETIC BRAKE—*Reuland Electric Co, Alhambra, Calif.* This magnetic brake contains only six major operating parts; direct, automatic set and release action between the solenoid and armature eliminates all levers and linkage. Brakes are available in 3, 10, and 25-ft-lb continuous duty ratings, and 15- and 35-ft-lb intermittent duty.



SOLENOID-OPERATED BRAKE — *Trombetta Solenoid Corp, 329 N Milwaukee St, Milwaukee, Wis.* The brake consists of four sets of springs, two solenoids, and one torque tie bolt connecting two independent operating units, one for each brake shoe. Precision alignment with the motor can be obtained after the brake has been mounted on the floor.

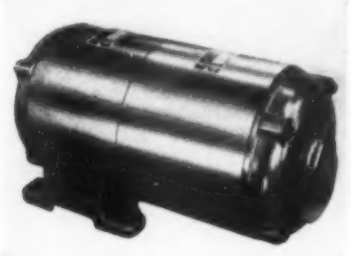


MAGNETIC POWDER CLUTCH — *LearCal Div, Lear, Inc, 11916 W Pico Blvd, Los Angeles 64, Calif.* Control medium of this clutch is a complex, dry iron powder mixture contained within an air-gap between two concentric pole surfaces of a rotating cylindrical electromagnet. Exciting the magnetic field applies a drag proportional to the applied excitation. Standard sizes are 1 in., 2 in., and $2\frac{1}{2}$ in., but larger sizes can be made for special applications.

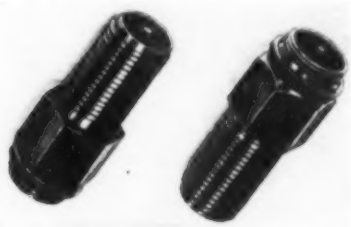
ELECTRIC BRAKE—*Warner Electric Brake & Clutch Co, Beloit, Wis.* Large electric brake for use on heavy machine tools measures 15 in. in dia and 5 in. in width. The brake will make it possible to convert to electrical stop and start equipment.

ELECTRIC BRAKE CONTROLLER—*Warner Electric Brake & Clutch Co, Beloit, Wis.* Electronic controller has been developed which can actuate an electric brake in 5/1000 of a second. In addition to increased operating speed, unit can be controlled at any distance from the brake.

TACHOMETER — *Metron Instrument Co, 432 Lincoln St, Denver 9, Colo.* Ten overlapping and adjoining ranges, instantly selected by rotary switch, provide more than a 10 to 1 spread in speed.



POWER SUPPLY—*American Electric Motors, 4811 Telegraph Rd, Los Angeles 22, Calif.* 400 cycle motor-alternator, meeting AN-E-19 requirements for power supplies. Size is 22x12x12 in., and weight 125 lb—making it a portable unit. Outputs are furnished in wattages up to 1000 single-phase, or 1800 3 phase. Single- or 3-phase common-shaft motor drives are available.



IMPULSE GENERATOR — *Electro Products Laboratories, Inc, 4501 N Ravenswood Ave, Chicago 40, Ill.* This electromagnetic pickup is an electrical-impulse generating device that produces a voltage output proportional to the rate of motion or speed of the magnetic object.

DEMAGNETIZING UNIT — *Lane & Curran, 440 Whitehall St, New York 4, N Y.* The Eclipse Demagnitizer (England) weighing 7 lb. It is compact and portable and with a low power consumption can be plugged into any lighting socket or power plug of suitable voltage and frequency.

MAGNETIC DRIVING DEVICES—*J H Williams & Co, 400 Vulcan St. Buffalo 7, N Y.* Adapter and hexagon-square shank have been developed for use only with Williams impact Supersockets to drive hex-head hardened and self-tapping screws. A telescopic magnetic device passes within an essembled socket and contacts the screw head, retaining the head within the socket opening. The magnet is embedded in the drive member and is spring loaded to overcome air gaps. The shank and adapter are available for ¼-in. drive tools with socket openings of ½, 9/32, 5/16 and ¾ in.

ELECTRONIC COUNTER—*Potter Instrument Co, Inc, 115 Cutter Mill Road, Great Neck, N J.* Predetermines two different selected counts occurring in sequence. The dual predetermining feature facilitates slowing down on the final stage of the cycle, to obtain satisfactory operation of gates, shears, and other devices.

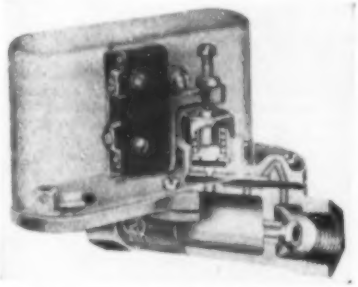
MAGAZINE RECORDER — *Alden Electronic & Impulse Recording Equipment Co, P O Box 125, Westboro, Mass.* Designed to record factors in anything that varies, i.e., punch-press operation, stresses and strains. Unit is plugged into a 110-v source, connected with a microswitch to object to be monitored, and a permanent record of 2 actions, plus time the action took place is made on a paper known as Alfax.

TACHOMETER HEADS—*Metron Instrument Co, 432 Lincoln St, Denver 9, Col.* Series 56M heads when used with Metron tachometer indicators, recorders, or controls can measure speeds between 200 and 10,000 rpm, and can be overspeeded 2 to 10 times without damage.

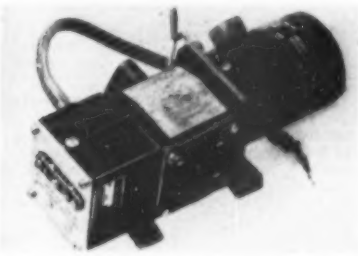
ELECTRONIC TIMER — *Photoswitch Inc, 77 Broadway, Cambridge 42, Mass.* The type 30HL1 is an automatic timer for intervals from 1/20 sec to 4 min. It provides four basic means of timing; interval, delayed action, automatic repeat, and programming, as well as many variations of these.

ELECTRONIC VIBRATION PICK-UP —*Erwood, Inc, 1770 Berteau St, Chicago 13, Ill.* By employing a pick-up probe and 3-stage amplifier, the Electro-Probe picks up vibrations at points of contact, but is unaffected by airborne noises.

MAGNETIC PROBE—*General Scientific Equipment Co, 2700 W Huntington St, Philadelphia 32, Pa.* The G-S magnetic probe is no larger than a fountain pen. The point of magnet is extended or retracted from a case by turning the end knob, with magnet strength controlled by amount of extension.



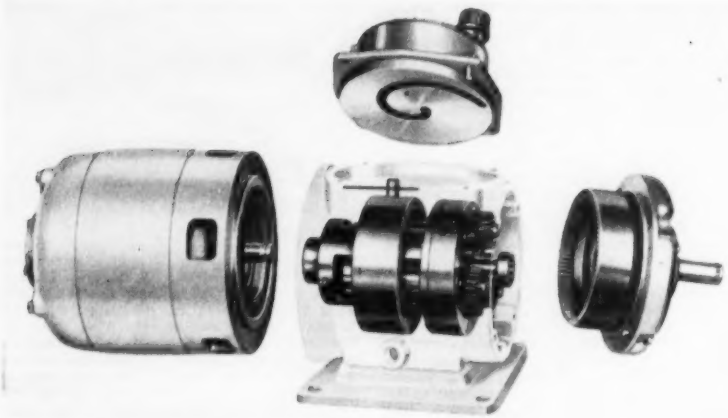
AUTOMATIC INTERLOCK — *Hays Manufacturing Co, Erie, Pa.* The Shur-Flo automatic interlock operates an electrical control switch which renders equipment inoperative or operates an alarm when the flow of water, air, or light oil in the supply lines deviates from requirements.



ROTARY ACTUATOR — *Hydro-Aire, Inc, Burbank, Calif.* This lightweight rotary actuator for driving flexible shafting in remote operating mechanisms is designed for operation on 220v, 400-cycle, 3-phase ac current.

STUD PREHEATER — *Edward L Wiegand Co, 7577 Thomas Blvd, Pittsburgh 8, Pa.* Heavy-duty electric heater is designed to preheat large studs for assembling castings in such heavy equipment as hydraulic presses. Chromalox electric tubular units are fitted in a gun-shaped stainless steel holder. Standard lengths range from 10 to 70 in.

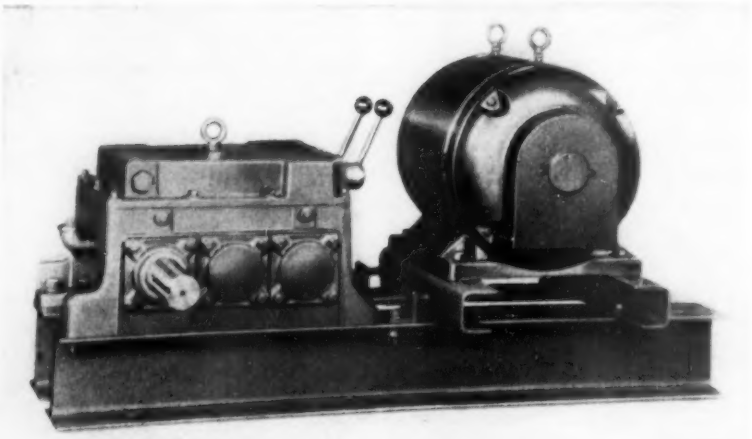
ELECTRONIC TIMER—*General Control Co, Boston 34, Mass.* Controls timed operations between 60 milliseconds and 60 seconds. Timing commences upon closure of any external switch; operation is from 115 v ac or 220 v ac, 60-cycle.



VARIABLE SPEED DRIVE—*Dodge Mfg Corp, Mishawaka, Ind.* Components of this variable speed drive are: variable pitch motor sheave; set of wide range belts; companion sheave; slide motor base. Dodge Taper-Lock principle is used in bushings for both sheaves to facilitate rapid speed changes.

SPEED REDUCER—*Eberhardt Denver Co, 1408 W Colfax Ave, Denver 4, Col.* Model 3L2 can be mounted with output shaft horizontal above or below input shaft, or in vertical position. Available in 9 different ratios; dimension of 3.250 in. from center of worm shaft to center of gear shaft. Varying with ratio, capacity will range between 3 hp down to ½ hp.

VARIABLE-SPEED TRANSMISSION—*Graham Transmissions, Inc, 3754 N Holton St, Milwaukee 12, Wis.* Model-18 light-power variable-speed transmission operates at 1800 rpm input without use of auxiliary spring loading, thus it provides extra-safe overload protection. In the event of a jam in the driven machine, the transmission can be stalled for a long period without damage to machine or transmission.



SPEED REDUCER — *The Pull-Gear Co, 21125 Dequindre, Hazel Park, Mich.* Model PG-7b speed reducer gives a 7 to 1 reduction directly from an electric motor. Spindle speeds of 45 to 2,000 rpm are possible by adjusting a knob on top of the unit. Made for machines using B-type belts, it is available in ¾ in. shaft bore size. Other Pull-Gear units are made for *A* belts.

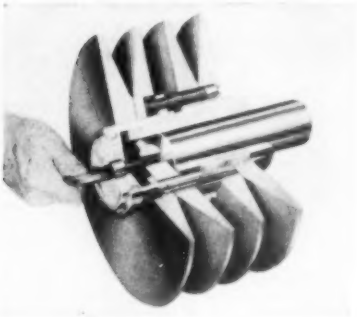
SPEED REDUCER—*Dodge Manufacturing Co, Mishawaka, Ind.* An overload release for the Dodge torque-arm speed reducer is said to provide instand and positive protection for driven machines, motors, and the torque-arm reducer itself.

VARIABLE SPEED PULLEY—*Gerbing Mfg Corp, Northbrook, Ill.* Var-A-Cone variable speed pulley permits use of standard A section belt. Infinitely variable speed changes within 2¾ to 1 ratio. Change is made while equipment is running. Unit is rated up to ¾ hp at 1750 rpm.

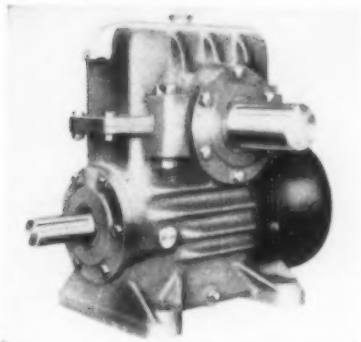
SPEED REDUCER—*Eberhardt-Denver Co, 1407 West Colfax Ave, Denver 4, Col.* The housing design of this speed reducer, aided by a fan mounted on the input shaft, is said to give greater thermal capacity. The new models are available in nine ratios from 5 to 1 up to 60 to 1. The smallest size has a center of worm shafts to center of gear shaft of 3 inches. Other sizes will be in even inches up to 7 inches.

VARIABLE PULLEY—*Gerbing Mfg Corp, Northbrook, Ill.* This Roto-Cone manually operated variable-pitch motor pulley, used in conjunction with the standard variable-pitch pulley and vari-speed belt, permits a speed-change ratio up to 9 to 1. Models are available for fractional- to 15-hp requirements.

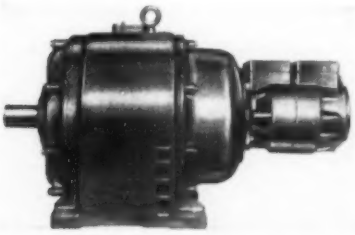
TRANSMISSIONS—*Turner Machinery Co, 3401 Terrace St, Kansas City 8, Mo.* Models 2004, 3004, and 5004 transmissions are available in ratings up to 60 hp. Standard unit is available in four speeds, some models can be supplied with six and nine speeds.



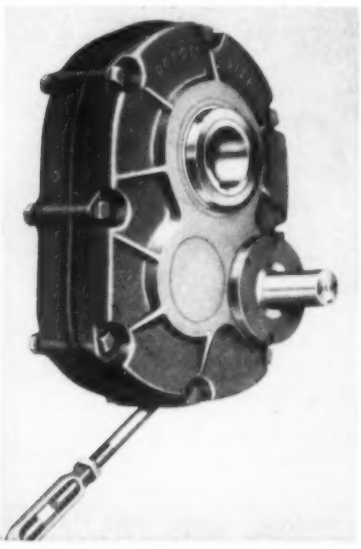
VARIABLE-SPEED DRIVE—*Dodge Mfg Corp, Mishawaka, Ind.* Components of this drive are: (1) a variable pitch motor sheave; (2) a set of wide-range belts; (3) a companion sheave; (4) a slide motor base. Dodge taper-lock principle is used in the bushings for both sheaves and the drive, enabling speed changes to be made quickly and easily. The variable sheave assembly locks on the motor shaft as a unit with the turn of a screw.



SPEED REDUCERS—*National Transmission Distributors, Inc, 684 Broadway, New York, N Y.* Crofts Radiation speed reducers have ratios ranging from 5 to 1 through 100 to 1 and from fractional up to 400 hp. The smaller worm-reduction units have universal mounting for worm on bottom, top, or vertical installation.

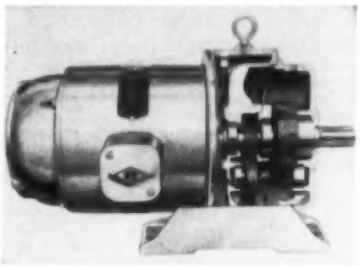


SPEED REDUCER—*Rucker Mfg Co, 4228 Hollis St, Oakland 8, Calif.* This fluid-powered speed reducer has all the gear ratios of conventional reducers with speed control from 0 to 2000 rpm at constant torque and with full reversibility; extreme torque down to 1 rpm.

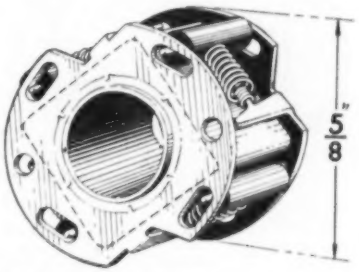


SPEED REDUCER—*Dodge Mfg Corp, Mishawaka, Ind.* Double-reduction shaft-mounted speed reducer has a capacity to 42 hp, and output speeds from 12 to 110 rpm. It is anchored with a torque arm which fastens to any fixed object.

SPEED-REDUCING PULLEY—*The Pull-Gear Co, 21125 Dequindre, Hazel Park, Mich.* The Pull-Gear speed reducer enables larger drills to be used on the drillpress without burning or stalling the motor. It replaces the standard three-step pulley, making possible a gear reduction of 4½ to 1 on each of the pulley steps.



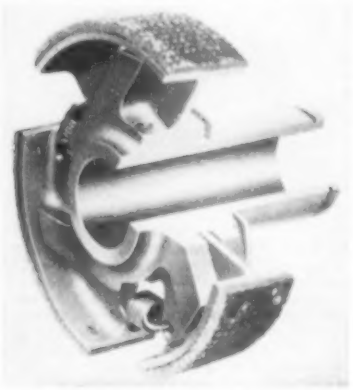
GEAR REDUCER—*Reuland Electric Co, Alhambra, Calif.* This gear reducer consists of a standard Reuland Fluid-Shaft motor and gear train designed into a single, compact unit. All are available in either drip-proof or totally enclosed designs with output speeds from 1 to 600 rpm.



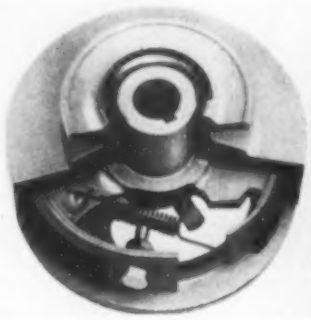
ROLLER CLUTCH—*High Precision, Inc, 375 Morse St, Hamden, Conn.* Available for recording instruments, servo mechanisms, and control devices. Miniclutch has an infinitely adjustable ratchet feed, automatic coupling mechanisms, selective coupling, free wheeling of high-inertia driven parts, dual or multiple drives, and backstop or one-way brake.

REVOLVING JOINT—*Barco Mfg Co, Dept J-1, 1801 Winnemac Ave, Chicago 40, Ill.* Light-running revolving joint is for making air- or hydraulic-line connections to high-speed rotating chucks, clutches, and similar equipment. It uses chemically inert V-ring seals which have a low friction coefficient. It is suitable for temperatures as high as 425 F, and speeds to 1800 rpm.

COUPLINGS—*Cone-Drive Gears Div, Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Flexible couplings for Cone-Drive worm shafts, gear shafts, and motor shafts are made in 22 bore sizes ranging from ¾ in. to 6½ in. with capacities from 4 to 550 hp.

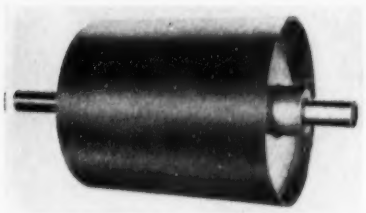


SELF-ENERGIZING CLUTCH—*Clutch Division, Elgin Sweeper Co, 5 Oak St, Elgin, Ill.* This automatic-centrifugal clutch, a self-energizing type, is designed to provide maximum efficiency of any gasoline engine or electric motor wherever load-starting requires a high initial torque.



CENTRIFUGAL CLUTCH—*Farm Easy Products, Muncie, Ind.* This lightweight, automatic, centrifugal clutch for all standard engines from ¾ to 10 hp engages and disengages at adjustable engine speeds ranging from 600 to 1500 rpm.

PULLEY GUARD PIN—*A A Metal Products, 6200 S Central Ave, Los Angeles 1, Calif.* Unit is installed as any other cotter pin, and easily removed. Clip on the pin depresses in installing or removing, yet sufficient strength holds it rigidly in place during use without any vibration. Type T is for cantilever installations; type K for two or more member installations. Units are 3/16 in. in dia, and vary from ½ in. to 5 in. in length.



PERMANENT-MAGNET PULLEY—*Magnetic Engineering & Mfg Co, Clifton, N J.* Magnetic pulleys allow the ferrous material to bridge the magnetic gap—otherwise impossible with ordinary parallel-pole pulleys. The pulleys are made of Alnico 5, in standard sizes up to 24 in. dia.

CONVEYOR PULLEY—*The American Pulley Co, 4200 Wissahickon Ave, Philadelphia 29, Pa.* Type HD heavy-duty conveyor pulley has a hub with a split-tapered construction for speed in installation and removal. The split-tapered hubs take firm grip on shafts, eliminating keys. The hubs are drawn into position by eight alloy-steel cap screws.

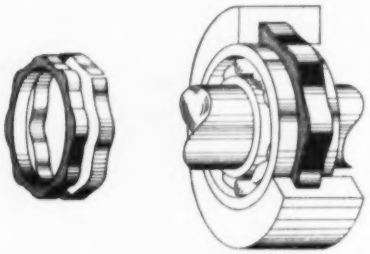
V-BELT SHEAVES—*W C Products, Inc, 1758 Berkeley St, Santa Monica, Calif.* Line of V-belt sheaves are molded from Compolete, a fibrous material which is molded to close tolerances under high pressure. Stocked in sizes from 2 to 6 in. OD, in graduations of ½ in.

PULLEY LAGGING COMPOUND — *Main Products Corp, 1241 Carpenter St, Philadelphia 47, Pa.* Uses, as one of its main constituents, Neoprene—the chemical rubber. The pulley surface can be quickly lagged in place by either brush or spray.

V-LINK BELT—*Brammer Co, 684 Broadway, N Y 12.* Links are claimed to contain more plys than on other V-link belts commonly used, be uniform in camber and dimension, and made from tough woven cloth impregnated with heat- and oil-resistant crude rubber.

PILLOW BLOCKS—*Dodge Mfg Corp, Mishawaka, Ind.* High radial and thrust capacities, and the ability to take heavy shock loads have been provided in these pillow blocks. The bearings are self-aligning with spherical outer race. Shaft sizes from 2 15/16 to 10 in. are available.

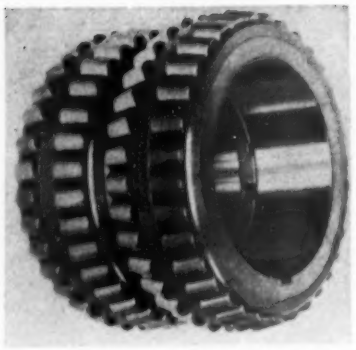
PILLOW BLOCK—*SKF Industries, Inc, Philadelphia 32, Pa.* A unit pillow block with a lubricant-retaining seal, said to achieve frictionless wiping action against the inner bearing ring, has been designed for general machinery use. Shaft dias range from 1 3/16 to 2 15/16 in.



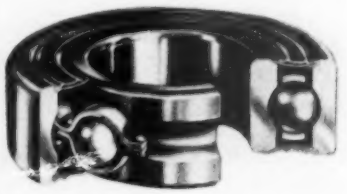
BEARING CONTROL — *Scintilla Magneto Div, Bendix Aviation Corp, Sidney, NY.* An anti-rotation device, composed of a waved steel spring and a molded rubber ring, has been designed to prevent outer race rotation of a floating bearing and eliminate resultant damage. Available for use with most popular-sized mm bearings.

SLEEVE BEARING—*Randall Graphite Bearings, Inc, 1011 S Greenlawn Ave, Lima, Ohio.* Compact self-aligning sleeve bearing is specially designed for light shaft duty and power take-off application. The bearing assembly measures 3½ in. in dia x 1¼ in., and is available with sintered bushing for shaft sizes ½, ⅝ and ¾ in.

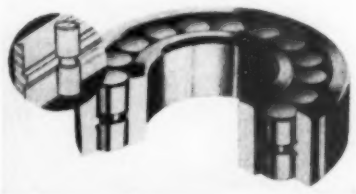
BALL BEARING BUSHING — *Split Ballbearing Corp, Lebanon, NH.* For applications where space is limited, Type DR-L bushing has a split outer race which permits introduction of a full complement of balls. Section height is only 0.250 in. Outer race is ground to close tolerance for press fit, with bore available for either press or slip fitting.



ANTI-FRICTION BEARINGS—*Tyson Bearing Corp, 1336 Oberlin Road, Massillon, Ohio.* Single-row bearings are available in sizes from 2 to 20 in. O.D.; two-row bearings from 4 to 20 in. O.D. and four-row bearings from 6 to 20 in. O.D. as additions to the Tyson line of full-roll tapered anti-friction bearings. For use in rod-, bar-, and strip-mills, table rolls, reels, straighteners, cranes, and other heavy metalworking machinery.

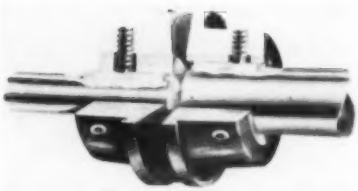


BALL BEARING—*SKF Industries Inc, Philadelphia 32, Pa.* Known as Red Seal bearings, the seal is made of Du Pont Fairprene, and is not affected by petroleum-base lubricants, normal operating temperatures, or aging. They are supplied in standard single-row SAE widths, and are available in any combination of snap rings and metal shields.



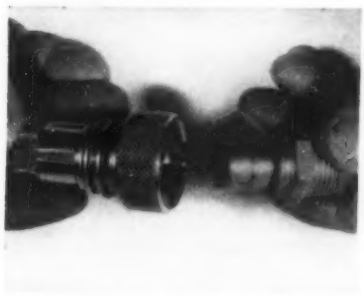
CAGELESS BEARING — *McGill Mfg Co, Valparaiso, Ind.* Grooved rollers and a guide rail are utilized in this bearing to keep the rollers in alignment—without cages.

PILOT-BEARING BUSHING— *J G Jergens Co, 11106 Avon Ave, Cleveland 5, Ohio.* Provides a lifetime seal against dust and grit. Cartridge design of the bearing holder means greater accuracy than bearings placed directly in machines or die fixtures, since it protects both thrust and radial loads and offers greater bar support due to greater bushing length. By using the bushings, it is claimed that tapered bearings can be adjusted to compensate for wear and are adaptable to receive removable slip bushings as well as keys or keyways.

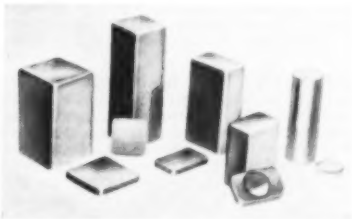


FLEXIBLE COUPLINGS—*New Products Div, Maurey Mfg Corp, Chicago 16, Ill.* Small, compact, cast-iron bushed flexible couplings are for applications up to 10 hp. In each of the couplings, two cast-iron hubs are joined by a bonded-rubber section made by Goodyear.

UNIVERSAL JOINT—*Curtis Universal Joint Co, Springfield, Mass.* Heavy-duty universal joint has 6-in. hub dia and a length of 15½ in. (double joint). Weight of the single joint is 98 lb, the double joint 155 lb.



COUPLINGS—*E B Wiggins Oil Tool Co, Inc, 3424 E Olympic Blvd, Los Angeles 23, Calif.* Streamlining the inner valve and employing a square-cut synthetic rubber gasket has provided good sealing and a pressure-drop reduction of 40% in these Wiggins couplings.



DRAWN CASES COVERS — *Hudson Tool and Die Co Inc, 118-122 South 14th St, Newark 7, N J.* Cases and covers are offered for prompt shipment from regular factory stocks on all standard shapes and sizes.

ALUMINUM BOXES—*Zero Mfg Co, 1121 Chestnut St, Burbank, Calif.* Available in more than 150 standard sizes or can be fabricated to specific requirements and furnished complete with fasteners installed, holes punched, and brackets mounted. Can be used as an instrument dial and gage boxes, precision junction and coil cases, or for various types of electrical and electronic parts.

BEVEL GEARS—*Michigan Powdered Metal Products Co, Inc, Northville, Mich.* Made of powdered metal of an iron or steel base with high tensile strength. Can be hardened, if required. Currently being manufactured in sizes from the smallest up to an outside dia of approximately 4 in.

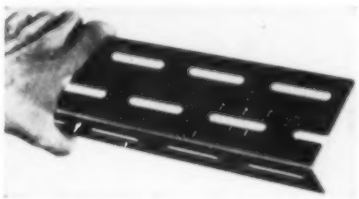
V-PACKING— *Mechanical Packing Div, Flexrock Co, 3670-B Cuthbert St, Philadelphia 4, Pa.* Continuous chevron-packing is designed for 500-6000 psi, and in two styles for either high or low temperatures. Sizes range from ¼ to 1 in., by 1/16 in. increments, 25 ft. per spiral.

HIGH-PRESSURE SPRINGS — *Producto Machine Co, Bridgeport, Conn.* Have been designed for all die applications and general machinery use. The drawn high-carbon oval wire permits a deflection of about 30% where maximum load rate and normal movement are required.

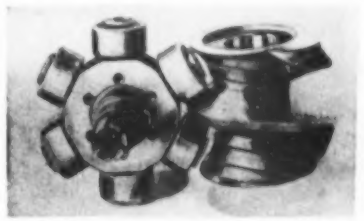
KNEE-ACTION CASTER—*All Steel Welded Truck Co, Rockford, Ill.* Protects loads by having a 2-in. vertical motion when obstructions are met. Both swivel and rigid types are available, in wheel sizes from 6 to 20 in. in dia. Weight capacity ranges from 90 to 1660 lb per caster, with heavier duty on special order.

QUICK-CONNECTING HOOKS — *Brummel Hook Co, Chicago 40, Ill.* Said to be a simple sure way of instantly attaching and detaching lines to other lines, wire rope, rope or chain, or to fixed objects. They are supplied in all sizes and types with fast or fixed-eye hooks, swivel hooks, fixed-jaw, etc.

REMOVABLE CAP-GUIDE PINS — *Superior Steel Products Corp, Milwaukee, Wis.* Designed to eliminate punch-holder bindings in separating diesets. It quickly ends troublesome locking problems when uneven pressures are exerted in separating the punch from the die holder.



ALL-PURPOSE ANGLE IRON—*Acme Steel Co, 2840 Archer Ave, Chicago 8, Ill.* DexAngle is a 10-ft long, 3x1.5x0.080-in. slotted-leg, galvanized-steel angle designed for all-purpose industrial fabrication. Sections that can be made from DexAngle are: C-channels, T, Z, and I sections and box sections.

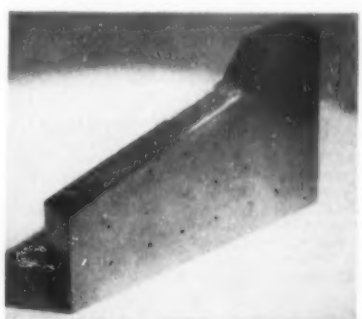


ROLLER GEAR DRIVE—*Roller Gear Div, Ferguson Machine & Tool Co, Inc, 471 Paul Ave, Ferguson 21, Mo.* Indexing or intermittent motion mechanism, permits high-speed precision, design versatility, and low maintenance on any application such as indexing dials, carriers, conveyors and indexing mechanisms. It has been used on dials and roll feeds, carrier chains and conveyors at speeds up to 800 pieces per minute.

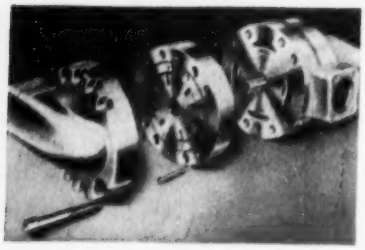
ROLLER CHAIN—*Whitney Chain Co, Hartford, Conn.* Uses oil-impregnated sintered-metal bushings. Chain is said to have a marked increase in service life on application where normal lubrication is not available.

COMBINATION STOPWATCH AND REVOLUTION COUNTER—*Montgomery and Co, Inc, 53 Park Place, New York 7, N Y.* Enables one man to check the speed of motors, machinery, rotating shafts, etc. Maximum speed is 5000 rpm.

TACHOMETER HEADS—*Metron Instrument Co, 432 Lincoln St, Denver 9, Colo.* Heavy-duty heads measure speeds as low as a fraction of an rpm. Built-in gearing permits direct engagement of very low speeds without need of speed changing drives. Speeds up to 199 rpm for full scale indication can be measured.



POWDERED-METAL WEAR PLATE —*Powdered Metal Products Co, Inc, Northville, Mich.* This all-metal wear plate is a single piece containing a large internal cavity. The cavity is filled with an extremely porous and rigid metal sponge containing lubricant. This metal sponge distributes lubricant to either surface of the plate through pores in the wall of the cavity.

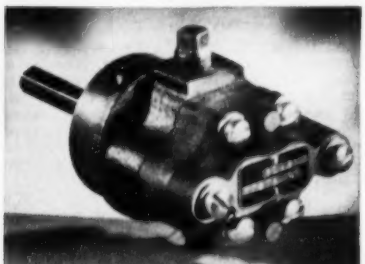


HYDRAULIC PUMP—*Denison Engineering Co, Columbus, Ohio.* Dual-purpose 2000-psi vaned oil-hydraulic pump can also be used as a fluid motor. In pump applications capacity levels range from 2½ to 60 gpm maximums; in fluid-motor use, range is from 12 to 257 in.-lb. of torque per 100 psi.

PUMP—*Milwaukee Hydropower Inc, 3447 N 35th St, Milwaukee 16, Wis.* The Magna-Mite, a low-priced positive-displacement pump of compact size, has a capacity from 1½ gpm down to ¼ gpm and less. It is similar to vane pumps in operation and construction, but differs in that vanes are replaced by rollers that contact the outer case as in a roller bearing.

ROTARY PUMP—*De Laval Steam Turbine Co, Trenton 2, N J.* Handles a wide variety of oil-handling applications and pressures up to 275 psi. It can be used for capacities to 80 pgm, and intermittent pressures up to 325 psi.

HYDRAULIC PUMP—*Kobe Inc, Div Dresser Equipment Co, Huntington Park, Calif.* Available in 15-, 30-, and 50-hp sizes with pressure ratings up to 5000 psi and displacement ratings up to 60 gpm. Special 10,000- and 20,000-psi heads are available.

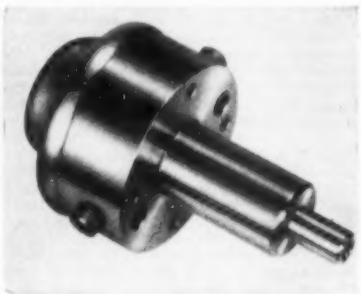


HYDRAULIC PUMPS—*Webster Electric Co, 1900 Clark St, Racine, Wis.* LAP and LAS Series of hydraulic gear pumps are designed for pressure lubricating, oil circulating, oil filtering systems, lift systems, oil transfer, and replenishing systems. Available in five sizes with capacities from ¼ to 2 gpm at 1800 rpm and 100 psi. They are recommended for pressure to 200 psi.

REVERSING PUMP—*Tuthill Pump C, 939 E 95th St, Chicago 19, Ill.* Measuring 2½-in. OD, by 4¼-in. long, Model RF provides compact unit of the automatic reversing type which delivers a constant flow from the same port regardless of the direction of shaft rotation, without the use of valves. Available in 3 sizes in capacities up to 2 gpm and pressure ranges up to 200 psi max.

PILOT VALVES—*Hannifin Corp, 1118 S Kilbourn Ave, Chicago 24, Ill.* Ten pilot valves, Series C, added to the Pilot-Master line can be used either two-way or three-way, normally closed to pressure or normally open. For direct control of small air cylinders or for remote control.

CENTRIFUGAL PUMP—*Kenco, Inc, 1125 North Ridge Rd, Lorain, Ohio.* Model P-109 centrifugal pump is made in the same design as Kenco bronze pumps, but is cast iron. Impellers and parts of the switches are still made of bronze. Available in automatic, non-automatic, and manual-automatic models.



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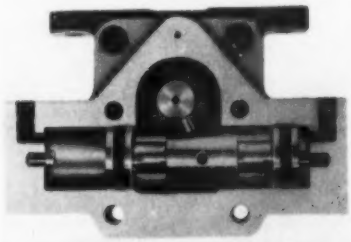
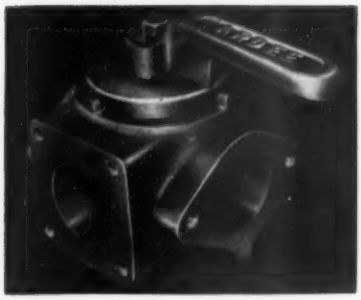
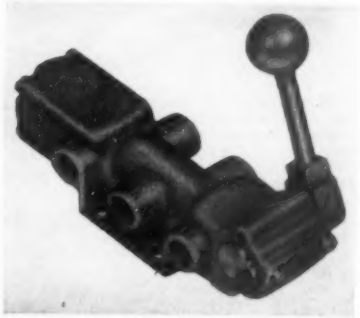


POWER-OPERATED VALVE — *Ledeen Mfg Co, 1600 S San Pedro St, Los Angeles 15, Calif.* POV valve, available in six sizes, is suitable for air, oil, and water operations, has the option of finger, cam, toe, or solenoid pilot controls. Can be used for remote control.

GAGE SNUBBERS—*Equipoise Controls, Inc, PO Box 269, Bronxville, N Y.* Porous stainless-steel disk damps pulsating pressures. Units are available in two standard sizes ¼- and ½-in. SPT. Steel bodies are rated at 20,000-psi operating pressure, brass bodies at 15,000 psi.



RECIRCULATING VALVE—*R D Mfg Co, 840 N Seward St, Los Angeles 38, Calif.* Recirculating valve for dividing works to 125 psi. Available in cast aluminum, steel, or navy bronze with 2 in. fittings.



VALVES — *Versa Products Co, 249 Scholes St, Brooklyn, NY.* The ⅛ and ¼ NPT size line of pneumatic and hydaulic valves includes 2-, 3-, and 4-way types with a choice of hand, foot, pilot, or cam-actuating devices, each with or without spring return. Normal operating pressure range of from 0 to 200 psig.

FOUR-WAY PILOT VALVE—*Automatic Valve Co, Farmington, Mich.* This solenoid-operated valve is for use on small, double-acting cylinders up to 3 in. in dia, and for larger cylinders where excess speeds are not required.

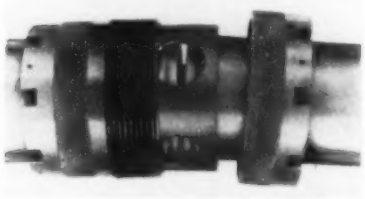
CAM VALVE—*Ross Operating Valve Co, 120 E Golden Gate, Detroit 3, Mich.* Excluding the camroller, this valve is less than 4 in. high and has a 3x3½-in. base. It is a ¼-in., four-way valve with a long lever. Lever travel is less than 1 in.

SHUTOFF VALVE—*Sprague Engineering & Sales Corp, Gardena, Calif.* The shutoff automatically cuts out gages from the system when pressure goes beyond their operating limits, thus protecting them from damage. The shutoff is available for low pressure, 30, 60, 100, 200, and 300 psi and high pressure, 500, 1000, 1500, 2000, 2500, 3000 and 5000 psi.

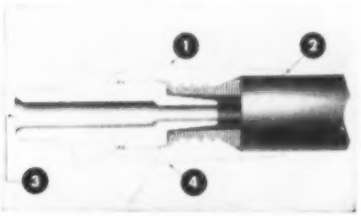
HYDRAULIC CYLINDERS—*Unit Mfg Co, 1221 Harmon Pl, Minneapolis 3, Minn.* A complete line of single- and double-acting types have been redesigned and generally improved. They are available in any of six clevis models. Cylinder can also be supplied to specifications.

REDUCING TUBE—*The Weatherhead Co, Industrial Div, Cleveland 8, Ohio.* Consisting of a body, nut, and sleeve, with one end machined in the form of a tube and a regular Ermeto connection on the opposite end, this reducer works equally well on high or low pressures. It will handle reductions ranging from 2 to ⅛ in.

ROTARY PRESSURE JOINT—*Seamlex Co, Inc, 4123-24th St, Long Island City, N Y.* Designed to convey liquids and gases from a stationary pipe line to a revolving receptacle. Standard class—15 capacity: 150 psi, 350 rpm, 350 F; standard sizes from ½ to 1¼ in. ips; available in syphon and single-flow types.



FLEXIBLE COUPLING—*E B Wiggins Oil Tool Co, Inc, 3424 East Olympic Blvd, Los Angeles 23, Calif.* Pressures in excess of 375 psi and temperatures from —65 to 400 F can be withstood by the flexible coupling. The coupling may be misaligned 3° without leaking and tube ends may be separated ½ in. without affecting sealing.



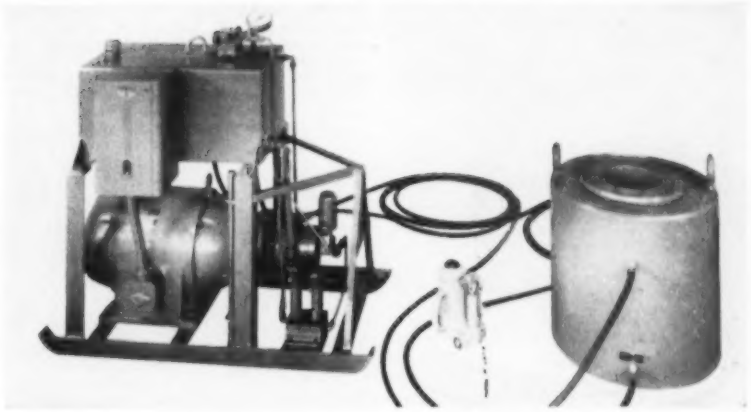
REUSABLE COUPLING—*Lincoln Engineering Co, 5751¼ Natural Bridge Ave, St Louis 20, Mo.* This coupling provides a positive grip—when core of hose is inserted in sleeve, wire braid is flared and gripped between shoulder of stud and shelf of sleeve with great force.

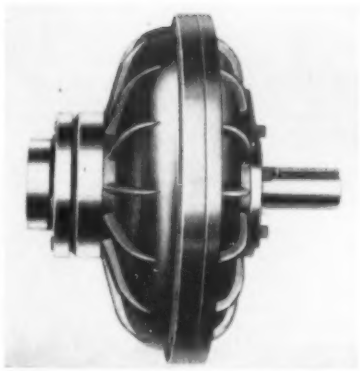
STAINLESS-STEEL FITTING—*Peter A Frasse & Co, 17 Grand St, New York 13, N. Y.* Quikupl stainless-steel fitting can be joined to tube or pipe without threading, flaring, sweat-soldering, brazing or welding. The pipe or tube is simply cut to length, deburred, and inserted in the fitting. The coupling is completed merely by setting a small screw.

PRESSURE-CONTROL TUBES — *Bailey Meter Co, 1052 Ivanhoe Rd, Cleveland 10, Ohio.* Armortube cable, a flexible, protected multi-tube transmission line consists of bundles of ¼-in. aluminum or copper tubing and encased in heavy, rust-resistant, galvanized steel strip.

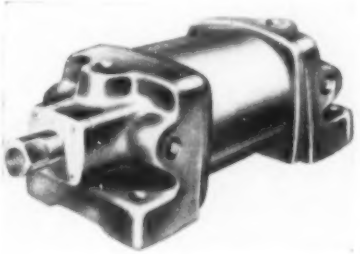
CUP EXPANDER — *HPL Manufacturing Co, 15115 Miles Ave, Cleveland 28, Ohio.* A line of cup expanders designated ES-11 has been developed to eliminate leakage in hydraulic and pneumatic cylinders. The expanders exert-controlled pressure on the packing lip so that it maintains constant contact with the cylinder wall.

TOGGLE VALVES—*Hoke, Inc, 199 South Dean St, Englewood, NJ.* With essentially the same type of valve as the smaller Hoke toggle valves, these brass and stainless steel valves have ½ in. NPT threads. Closing action is provided by hardened steel cam rather than a spring to permit pressures to 1000 psi.





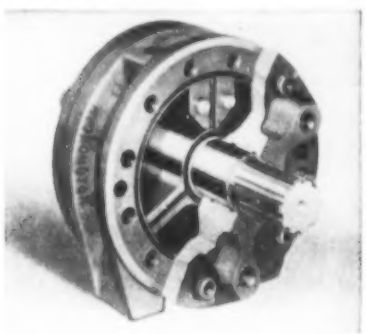
LIQUID DRIVES—*Liquid-Drive Corp, Holly, Mich.* These liquid drives transmit power at high efficiency by oil circulation in a vortex. There is no mechanical connection between the driven load and the driving motor. TF units, made of aluminum, available 1½ hp at 120 rpm to 25 hp at 1800 rpm. TH unit steel has a capacity of from 10 hp at 870 rpm, to 75 hp at 1800 rpm. TS units aluminum range from 1½ hp at 1200 rpm to 24 hp at 1800 rpm.



CYLINDERS—*Excel Machine & Mill Supply Co, Williamsville, N Y.* Complete line of high- and low-pressure hydraulic and air cylinders features self-adjusting rod packing and leak-proof adjustable cushions. Bores 1½-in. to 12-in. dia, up to 48-in. strokes. High-pressure units are designed for 2000 psi, low pressure for 800 psi.

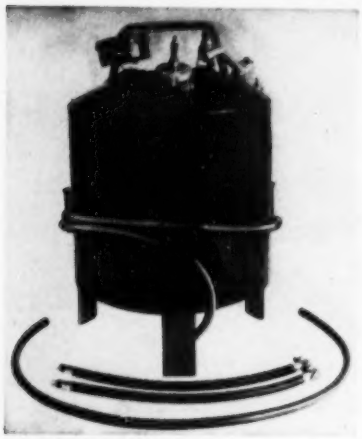
PLASTIC TUBING—*US Stoneware Co, Akron, Ohio.* Tygon tubing is chemically resistant, translucent, non-toxic, and especially designed for high-pressure applications. Braided stainless-steel reinforcement. The tubing is stocked in ¼ and ⅜ in. ID.

HYDRAULIC JACK—*Templeton, Kenly & Co, Chicago, Ill.* 600-ton unit, operated by a 10-hp motor, is double-acting for use in large electric plants. Weight of ram is 1750 lb. After desired tonnage is run up with motor, extra tonnage can be added gradually with two hand pumps. 6½-in. travel is provided in 7¾-in. center hole.

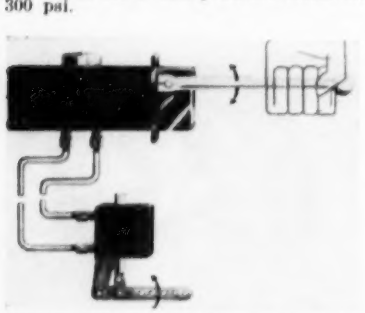


RECIPROCATING ROTARY ACTUATORS—*Hydromotor Div, The Bonnot Co, Canton 2, Ohio.* Hydromotor employing air, oil, or other fluid medium, provides equal power in either direction. It can be readily controlled as to speed or arc of travel. Single vane units, good for a 280° arc of travel, will supply double the torque values when an extra vane is added; a max arc of 100 will serve.

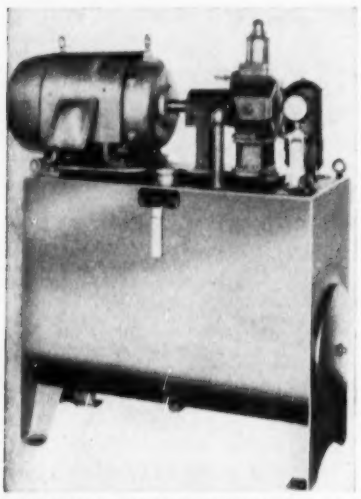
ALUMINUM TUBING—*Parker Appliance Co, 17325 Euclid Ave, Cleveland 12, Ohio.* A standard-stock line of aluminum-tube fittings for industrial fluid-handling systems and similar applications is available at less cost than copper-brass. Line includes male and female connectors, elbows, tees, union, and tube-end reducer for ¼-, 5/16-, ⅜-, and ½-in. outside tubing.



FILLING-BLEEDING TANK—*Superdraulic Corp, 14256 Wyoming Ave, Detroit 4, Mich.* This unit holds 2¼ gal. of oil and meets military specifications No. MIL-T-5182. The unit operates at a temperature range of from minus 65 to plus 130 F and pressure-tested at 300 psi.

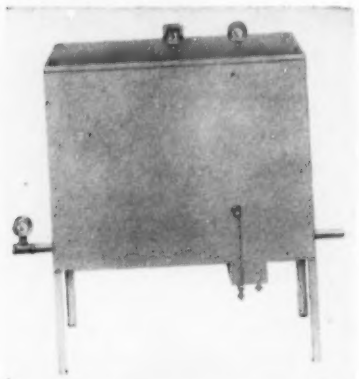


HYDRAULIC REMOTE-CONTROL UNIT—*Superdraulic Corp, 14256 Wyoming Ave, Detroit, Mich.* This hydraulic remote-control unit is a simplified device for positioning, controlling and duplicating movement at a distance.



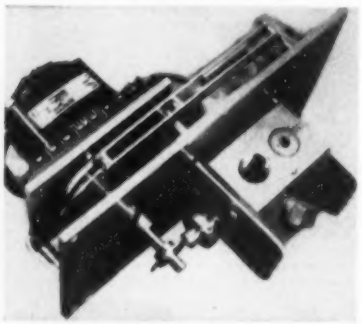
HYDRAULIC POWER UNITS — *Superdraulic Corp, 14256 Wyoming Ave, Detroit 14, Mich.* Design features such details as ample floor clearance, large tank cleanouts in both ends, sight gages, filler and bleeder caps on both ends, and oil filters. Available in 30-, 60-, and 80-gal. sizes.

FLOW CONTROL—*Reeves Pulley Co, Columbus, Ind.* Conoflow control is available on all integral horsepower Reeves Vari-Speed Motordrives. It permits control of liquid levels in tanks and provides automatic control of flow proportioning systems.



HYDRAULIC POWER PACKAGE—*Sprague Engineering & Sales Corp, Gardena, Calif.* This hydraulic power package for oil or water services is broadly applicable for a wide variety of uses where low-volume output at high pressure is the requirement, such as in hydrostatic testing.

PACKING—*Periflex, Inc, Hazel Park, Mich.* Periflex Set No. 88 is a V packing which comes in rings only. Set consists of any given number of rings, plus male and female end adapters. Primary application is as rod seal.

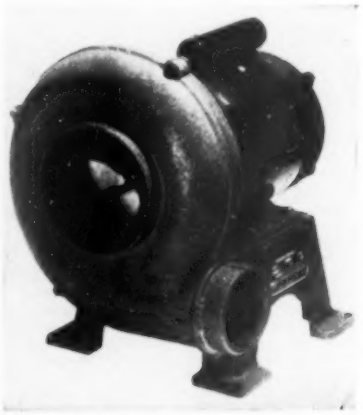


CONTROL SERVO CYLINDER—*Automatic Temperature Control Co, Inc, Pulaski Ave, Philadelphia 44, Pa.* A method of remotely controlling a hydraulic or pneumatic servo cylinder within 0.001 in., known as the Atcotran hydraulic-pneumatic system, provides automatic positioning of control pistons from variables such as pressure, position, tension, flow, force, or torque. These variables are measured by various types of transmitters.

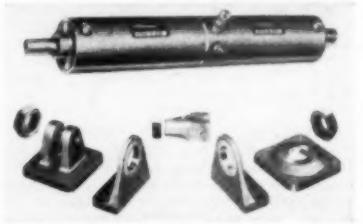
AIRLINE FILTER—*C A Norgren Co, 3400 Elati, Englewood, Denver, Colo.* Removes corrosive moisture, abrasive pipe scale and other foreign matter from ¾- to 1-in. compressed air lines. It is for use on air flows from 0 to 140 cfm at pressure of 0 to 150 psi, and temps between 40 to 120 F.

AIR DRIER—*Van Products Co, 3734 W 12th St, Erie, Pa.* Besides removing moisture, oil and dirt from compressed air and gases, this unit reduces humidity below the condensation point and acts as a storage tank. Model 200 for volumes to 200 cfm at 100 psi. Model 25 delivers 25 cfm at 100 psi.

AIR COMPRESSOR — *Curtis Pneumatic Machinery Div, St Louis 20, Mo.* Model No. 98 compressor has a 7½x5-in. low pressure, and a 4 3/15x5-in. high-pressure cylinder. Piston displacements range from 78 to 92 cfm at pressures from 100 to 175 lb with 15-hp motor, and 108 cfm at 100 to 125 lb with 20-hp motor.

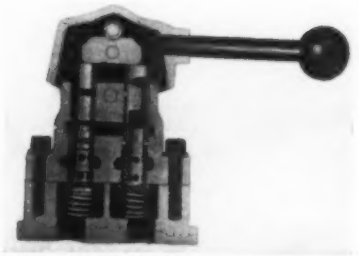


BLOWER—*Standard Electric Mfg Co, Inc, West Berlin 12, NJ.* Removes fumes, smoke, and obnoxious odors up to 450 cfpm. Standard unit has 5½-in. inlet and 3½-in. outlet.



AIR HYDRAULIC—*Modernair Corp, San Leandro, Calif.* Features interchangeable mounting brackets. Standard shop air-line pressure actuates the cylinder with the built-in hydraulic system regulating forward or reverse stroke movement by adjustment of speed control. The flush exterior permits installation in restricted space. If used for machining, the cylinder permits rapid traverse (if skip feed by-pass is used), finely controlled movement of work, and fast reverse action.

AFTER COOLER — *Niagara Blower Co, 405 Lexington Ave, New York 17, N Y.* Cools compressed air or gases by the evaporation of recirculating water sprays on the surface of tubes through which the compressed air passes. Tube sizes have been increased to reduce friction.



AIR-CONTROL VALVES—*Numatics, Milford, Mich.* This line of air-controlled valves now incorporates several improvements for faster, trouble-free action. Neutral position or lever is maintained by two light springs located directly underneath lower poppets.

CONDENSATE FILTER—*James A Murphy & Co. Inc, Hamilton, Ohio.* This separator filter adapted for ½ or ¾-in. lines not only removes the condensate liquid from compressed air, but any vapors present as well.

AIR-CONTROL VALVE—*Hannifin Corp, 1118 S Kilbourn Ave, Chicago 24, Ill.* This three-way solenoid pilot-master valve for especially hazardous applications is so designed that it fails safe under all conditions. One size of pilot head fits all five sizes of master valve from ⅜ through 1¼ in. ips.

FOUR-WAY AIR VALVE—*Airmatic Valve Co, 1643 E 40th St, Cleveland, Ohio.* This air-control valve, Model MV-4-375, may be used with pilot valves to provide automatic and semi-automatic operations, sequence of operations, and remote control paneling. It is for use with air, oil, or water at pressures up to 0-150 lb.

THROTTLING CONTROL VALVES—*Conoflow Corp, 2100 Arch St, Philadelphia, Pa.* This line of throttling control valves utilizes pneumatic cylinder operators and venturi ball valves. The combination of units is said to simplify difficult control problems involving corrosive fluids, abrasive materials, and high temp and pressure applications.

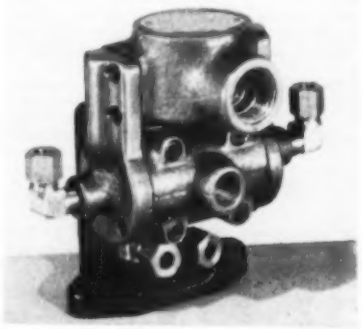
PNEUMATIC—*US Electrical Motors, 200 E Slauson Ave, Los Angeles 54, Calif.* Controls cosists of a positioning unit—an air-operated plunger attached to the Varidrive speed changing device, and an air valve which remotely controls the positioning unit. Four types of valves available: pedal, lever, cam, or wheel; positioning of either 60 or 100 psi.

AIR VALVES—*Rivett Lathe & Grinder, Inc, Brighton 35, Boston, Mass.* Series 3000 pilot air valves are for remote control of pilot pressure-operated four-way air valves. They can also be used for remote control of Rivett air pilot hydraulic valves. Palm button, pushbutton, and cam operation are offered in both side and foot mountings. Foot and solenoid types are offered only in foot mountings.

AIR CONTROL VALVES—*Valvair Corp, 983 Beardsley Ave, Akron 11, Ohio.* In neutral position all ports are blocked on this spring-centered air control valve. Either three- or four-way piped exhaust is available in sizes of ¼, ⅜, ½, ¾, and 1 in.

AIR-CONTROL VALVE—*Kindt-Collins Co, 12653 Elmwood Ave, Cleveland 11, Ohio.* Ventomatic opens and closes automatically as the machine switch is turned on and off. This prevents the continual exhausting of warm air from the room, when the machine is not operating, and effects important heating economies.

AIR REGULATOR—*C A Norgren Co, 3400 S Elati St, Englewood, Colo.* Series 11,400-2 is a precision regulator, relieving type of air valve for applications on air-controlled instruments and for inert-gas lines. Maximum pressure is 400 psi, delivery pressure is zero to 30 psi or 50 with an adjusting spring, and thread size is ¼ in.



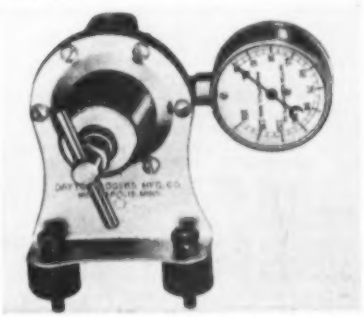
AIR CONTROL VALVE—*The Bellows Co, Akron 9, Ohio.* The EXV Electro-aire valve is a low-voltage, electrically controlled air valve. Powered by air, it is also explosion proof. Built into the one unit is a four-way directional slide valve, solenoid control units, and piston-rod speed regulators.

AIR CONTROL VALVE—*Hannifin Corp, 1118 S Kilbourn Ave, Chicago 24, Ill.* Pilot-Master directional control of air pressure has the main or master valve portion operated either 2-way or 3-way; normally open or normally closed to pressure, without any internal change whatever.

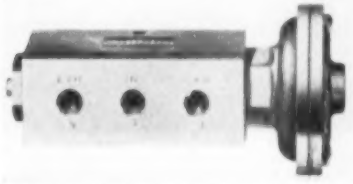
AIR TRANSFORMER—*DeVilbiss Co, Toledo, Ohio.* Has a built-in two stage regulator which provides easier adjustment of pressure, requiring only fingertip control of the adjusting knob. Knob actuates a small pilot regulator which, in turn, operates the diaphragm of the large regulator. There is also closer control of pressure loss.

AIR COMPRESSOR—*National Tool & Equipment Co, 1807 W Lake St, Chicago, Ill.* The Model B-100 air compressor has a 12-gal. stainless-steel receiver; a V-belt driven, ½-hp, 1725-rpm capacitor motor; pressure gage; safety valve; drain cock; and semi-pneumatic rubber-tired steel wheels.

AIR COMPRESSOR—*Ingersoll-Rand Co, 11 Broadway, New York, NY.* Le design air compressor embodies a single vertical low-pressure compressor cylinder, a horizontal high-pressure cylinder, and a synchronous or induction motor mounted directly on the crankshaft. One innovation is pipeless, through-frame air flow.

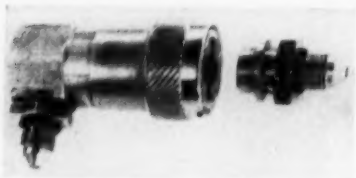


REDUCING REGULATOR—*Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Secondary compressed air pressures are regulated to 150 lb. Two vibration dampers eliminate shock and concussion blows. Four sizes for ¼-, ⅜-, ½-, and ¾-in. pipe connections. Optional pressure gage records the primary pressure used or wanted on the equipment at the point of operation.



DIAPHRAGM VALVE—*C B Hunt & Son, Inc, Salem, Ohio.* This diaphragm-operated spring-return, single-plunger valve is for use when only low-pressure air is available for pilot control. They are furnished tapped for either ⅛- or ¼-in. pipe connection, in 2-way, 3-way, double 2-way, 4-way, and 5-way designs.

AIR FILTER—*C A Norgren Co, 3400 S Elati St, Englewood, Colo.* Flows up to 140 cfm, pressures to 150 psi, and temperatures from 40F to 120F are recommended operating conditions for Series 22B-6 and -8 filters or ¾- and 1-in. pipe lines.



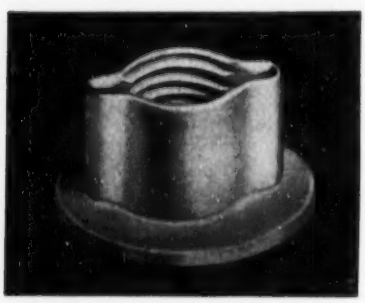
PNEUMATIC COUPLING—*E B Wiggins Oil Tool Co, Inc, 3424 E Olympic Blvd, Los Angeles, Calif.* Designed for oxygen systems, missiles, gun chargers, and high-pressure greasing systems. Can be disconnected quickly, and connected just as easily even against high pressures.

AUTOMATIC FILTER DRAIN—*C A Norgren Co, Englewood, Colorado.* This unit is for use in air lines, with portable air tools, air cylinders, and air-powered machines where removal of liquids and solids from air lines is required and where manual draining is not desired or practical. It is recommended for a flow of 0 to 35 cfm at pressures from 0 to 150 psi in temperatures from 40 to 120 F.

AIR CYLINDERS—*Rivett Lathe & Grinder, Inc, Brighton 35, Boston, Mass.* Rivett air cylinder follows the design of their hydraulic cylinder by using keeper rings to hold covers together instead of tie rods. This permits the covers to be rotated to convenient pipe locations. Recommended for pressures up to 150 psi, the air cylinders are available in seven mounting styles, in any length of stroke up to 96 in.

AIR CYLINDER — *The Tompkins-Johnson Co, Jackson, Mich.* The flexible seal used in these air cylinders is claimed to: (1) provide positive cushion action (2) automatic valving for fast return stroke. Capacities are 100 to 12000 lb for power movement in any direction.

AIR FRICTION CLUTCH—*Cardwell Manufacturing Co, Inc, Clutch Div, Wichita, Kan.* Unit is available in single and multiple tube and plate design; either spring engaged and air released, or air engaged and spring released.



SPRING ACTION LOCKNUT—*E A Bessom Corp, Salem, Mass.* The Con-Torq nut is constructed with a flange and tempered dieset-ribbed barrel, heat-treated to a spring temper. This affords a concentrated spring action of such power that when applied to a bolt or screw, the nut defies vibration, moisture, extremes of heat or cold, or any other condition, to shake it loose.

FASTENING PIN—*C E M Co, 24 School St, Danielson, Conn.* Spirai pins are machine pins which have been formed by rolling strip steel spirally. The physical properties of the pin can be changed by varying the thickness of the strip, the tightness of the coils, and the number of coils in the spiral.

THREAD STUDS—*Northwestern Tool & Engineering Co, Dayton 3, Ohio.* Additional sizes of cut thread studs available in the Northwestern line include: from 2 in. to 20 in. long in 5/16-18; ⅜-16; ½-13; ⅝-11; ¾-10; ⅞-9; and 1 in.-8.

FERRULE-CONTRACTING MACHINE—*A Schrader's Son, Div Scoville Mfg Co, Inc, 470 Vanderbilt Ave, Brooklyn 17, N Y.* This air-operated ferrule-contracting machine is said to make possible production speed where quantities of uniform, fitted hose length are required.

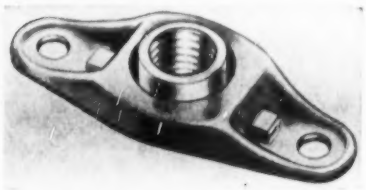
FASTENING DEVICE—*Shakeproof Inc, St Charles Road, Elgin, Ill.* For attaching plastic push buttons to switch arms, is equipped with spring-action prongs which engage the inner surface of the button, locking it securely in place. Positive resistance to the loosening effect of vibration.

THREAD INSERTS—*Heli-Coil Corp, Danbury, Conn.* Available in the following standard sizes and thread classifications: 440 to 1½-6 sizes, in the National and Unified Coarse thread series; 6-40 to 1½-12 in the National and Unified Fine thread series; 10-1.0 mm to ⅞-18 in the automotive spark-plug series; 14-1.25 mm to 18-1.5 mm in the aviation spark-plug series; and ¼-27 to 1-1½ in the pipe-thread series.

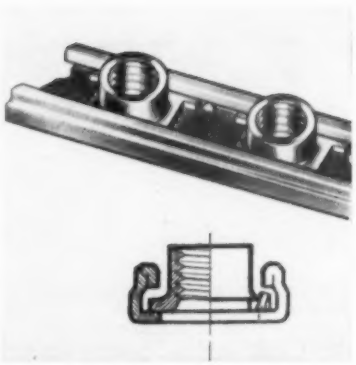
LOCKNUT — *The Security Locknut Corp, North and 15th Ave, Melrose Park, Ill.* Consists of a standard steel nut and a slightly elliptical retainer ring combined in a single unit, and when applied can be used simply as a replacement for a standard nut.

COLD-PUNCHED NUTS—*Jacobson Mfg Co, Inc, Kenilworth 3, N J.* Line includes conduit locknuts, machine-screw nuts (square or hexagon), and electrical fixture nuts; special types can be supplied upon specification.

BLIND RIVETS—*Huck Mfg Co, 2480 Belleville Ave, Detroit 7, Mich.* Provide an increased bearing area when fastening thin or soft materials to metal frame-works. Available in both aluminum and steel. Sizes are: ⅛, 3/16, and ¼ in. dia.



FLOATING ANCHOR NUT—*Kaynar Mfg Co, Kaylock Div, 820 E 16th St, Los Angeles, Calif.* This lightweight, self-locking floating anchor nut consists of a threaded nut portion and a retaining shell providing a 1/16-in. radial movement between nut and anchoring portion.



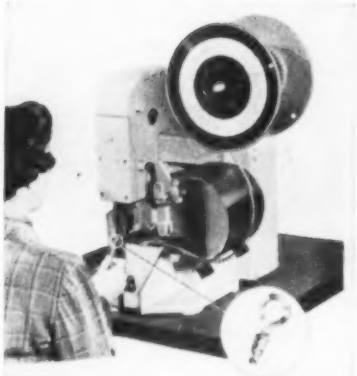
LOCK-NUT FASTENER — *Kaylock Div, Kaynar Mfg Co Inc, 820 E 16th St, Los Angeles, Calif.* Containing spring-steel lightweight lock nuts as inserts, this multiple nut fastener is reported to be narrower, lower, lighter and stronger than any similar product.

DRIVE RIVET—*Southco Div, South Chester Corp, 1418 S Penn Square, Philadelphia 2, Pa.* This ⅛-in.-dia. hammer-driven blind rivet is installed merely by tapping on a pin with an ordinary hammer. The rivets are available in modified brazier or 100° countersunk-head styles, with grip lengths from 1/32 to 13/32 in.

SPLICING METHOD—*Manco Mfg Co, Bradley, Ill.* Model R-120-187E Guillotine. Splicer unit and splicer clips to connect wire ends of coils for drawing through patenting furnaces. Unit has an available thrust of 10 tons; operating cycle is one second.

TOGGLE BOLTS—*Super-Grip Anchor Bolt Co, 3333 N 22nd St, Philadelphia 40, Pa.* May be installed with the head outside the wall, or with the nut outside the wall; toggles may be purchased separately for use with any bolt. Toggle head is available for bolt dias from ¼ in. up to ½ in.

SELF-ENERGIZING LOCKNUT — *Klincher Locknut Corp, 2153 Hillside Ave, Indianapolis, Ind.* An all-metal seating type that is usable over and over. A grooved washer at the bottom of the nut is pressed over the threaded section suspended from the main body of the nut. It is available in various materials and will withstand temperatures up to 1600 F.



SOLDERLESS TERMINALS — *Aircraft-Marine Products, Inc, 2100 Paxton St, Harrisburg, Pa.* This machine is capable of applying terminals at rates of up to 4000 per hr, depending upon the type of terminal and the operator. Preset crimping dies cut the terminal from the strip and crimp it to the wire.

BUTTON-HEAD HEXAGON SOCKET SCREW—*Standard Pressed Steel Co, Box 875, Jenkintown, Pa.* Made of alloy steel, heat treated. Can be used without loss of strength in place of screws with higher heads. Seven thread diameters: No. 8, No. 10, ¼ in.; 5/16, ⅜, ½ and ⅝. All except the ½ and ⅝ which are produced in the National Coarse series only, are available in both National Coarse and National Fine threads.

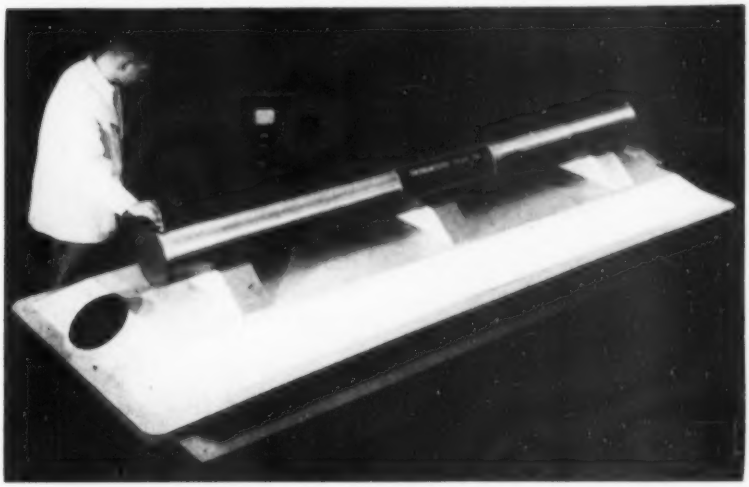
PYROBOND ADHESIVE — *World Bestos, New Castle, Ind.* For bonding shell mold halves, is applied to mold as a film or liquid; when heat-cured, it bonds securely, eliminating need for clamps or bolts. Adhesives can be applied closely to casting cavities and holds mold evenly; need for shot or silica sand backing is eliminated.

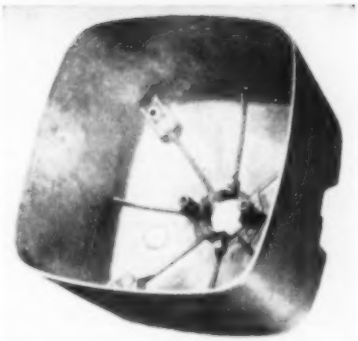
ADHESIVES — *Armstrong Products Co, Box 1, Warsaw, Ind.* Epoxy resin adhesives provide permanent attachment for metal, glass, ceramic, wood, plastic, fabric, and hard rubber surfaces. Curing may be accomplished at room temp or more rapidly at elevated temp. to 250 F. Most rigid materials may be bonded to produce shear and tensile strengths in excess of 2500 psi.

ANCHOR BOLTS—*Super-Grip Anchor Bolt Co, 3333 N 22nd St, Philadelphia 40, Pa.* After insertion of the anchor bolt, lead sleeve, and cup-shaped steel anchor, a tamping tool mushrooms the lead first. Repeated blows flatten out the steel anchor driving its ribbed steel edges into the walls of the hole.

STOP NUTS—*Elastic Stop Nut Corp of America, 2330 Vauxhall Union, NJ.* A line of hexagonal stop nuts as small as 0.109 in. across flats has nylon locking inserts. They are available in brass and aluminum. Smallest previous ESNA nut was 0.250 in. across flats. They are made in sizes 0 through No. 4 in National Coarse and National Fine threads.

SELF-LOCKING PIN—*Self Lock Fastener Corp, 259 Stephens St, Belleville 9, N J.* The Sel-Lok spring pin is a heat-treated tubular slotted dowel pin manufactured in both standard and light-duty types. It is said to be an inexpensive and highly efficient hollow pin with chamfered ends permitting easy, rapid insertion.





DIE STEEL—*Carpenter Steel Co, Reading, Pa.* Super Samson is primarily for dies used in die casting aluminum and zinc. Also being used in plastic-mold work involving large cavities or elevated temperatures. It is 50 to 60% as easy to hub as soft irons and yet has high strength and good resistance to heat and abrasion.

AIR-HARDENED DIE STEEL—*Simonds Saw and Steel Co, Fitchburg, Mass.* Said to be more wear-resistant than oil-hardened and therefore is ideal for punches or dies to be used on silicon or stainless steels, Monel metal, or other abrasive metal.

STAINLESS-STEEL SHEETS—*Micro Metallic Corp, 30 Sea Cliff Ave, Glen Cove, N Y.* High-tensile, smooth-surface, porous stainless-steel sheets are available with shear strengths in the range of 60,000 psi; surface smoothness is comparable with commercial rolled stainless-steel-sheet finishes.

CLAD METALS—*General Plate Div, Metals & Controls Corp, Attleboro, Mass.* Composite metal combinations recently developed include: titanium-clad steel, zirconium-clad nickel, calcium-clad nickel, platinum-clad stainless, copper-clad magnesium, and nickel-clad copper.

STAINLESS STEEL—*Carpenter Steel Co, Reading, Pa.* A Chrome-nickel austenitic stainless steel has been developed that work-hardens far more slowly than conventional grades of stainless. Its use makes possible commercial production of chrome-nickel fastenings and other parts requiring similar drastic cold heading or upsetting operations.

TOOL STEEL—*Latrobe Steel Co, Latrobe, Pa.* Latrobe can now produce Desegetized steels (free of carbide segregation) in much larger sizes than former limit of 500 lb. High-carbon, high-chromium and high-speed steels are available in 12-in. sections.

ALLOY STEEL—*The Carpenter Steel Co, 309 W Bern St, Reading, Pa.* No. 5-876 steel is for hard-tempered parts requiring high surface hardness and good strength and toughness, tough-tempered parts which do not require high surface hardness but must have strength and toughness, and for a mild-tempered alloy steel that can be readily machined in the treated condition as received.

TOOL STEEL—*Steel and Tube Div, The Timken Roller Bearing Co, Canton 6, Ohio.* Product has the advantages of graphitic tool steel plus convenience of a hollow-bar section in manufacturing ring gages, dies, and other annular tool-steel parts. Stock sizes will range from 4 to 16 in. outside dia with a variety of wall thicknesses.

AIR HARDENING FLAT STOCK—*L S Starrett Co, Athol, Mass.* Precision ground die and flat stock, made to a special analysis for hardening in air, is available for punches and dies used in long production runs or for stamping silicon, stainless steel, Monel, and other abrasive materials. An average of 50% more pieces per sharpening can be expected than with oil hardening steel.

LEAD-BEARING STEELS—*La Salle Steel Co, 1412—150th St, Hammond, Ind.* Super La-Led is a free-machining, open-hearth steel containing about ¼% lead and nearly ½% sulphur. Lead addition in the other new steel, TS-4140 Modified, is to improve machinability — heat-treating characteristics, hardenability, and mechanical properties are not affected by the addition.

COPPER-CLAD SHEET STEEL — *Automatic Gas Flux Co, Cleveland, Ohio.* These bi-metal sheets combine the corrosion resistance of copper with the strength of steel, and can be deep drawn or otherwise deformed without danger of separation of the constituent metals. Sheets down to 16-gage thickness and 30 in. wide were successfully hot rolled and this metal was then cold-rolled down to 0.005 in. thickness.

STAINLESS STEELS—*Allegheny Ludlum Steel Corp, Pittsburgh 22, Pa.* New group of stainless steels uses manganese to replace all or most of the critical nickel used in conventional chromium-nickel stainless steels.

THREADED STEEL ROD — *Redi-Bolt, P O Box 6102, Chicago, Ill.* The Redi-Bolt comes in straight 36-in. lengths and in six dias—¼, 5/16, ⅜, ½, ⅝, and ¾ in.—threaded the full length. It is made of cold-drawn steel and is coated against rust.

HIGH-NICKEL ALLOYS — *American Silver Co, 36-07 Prince St, Flushing 54, NY.* Available rolled to specifications in strip up to 8 in. wide and down to 0.0005 in. thick to tolerances as close as 0.0001 in. Include nickel-iron, nickel-chrome, nickel-cobalt-iron, and nickel-molybdenum-iron.

ALUMINUM—*Aluminum Co of America, 801 Gulf Bldg, Pittsburgh 19, Pa.* Alcoa C57S is an aluminum alloy which takes a brilliant Aluminite finish in many shades of color. Approaches high-purity aluminum in transparency and metallic luster, with higher mechanical properties and excellent forming characteristics.

ALUMINUM COILED TUBES—*Aluminum Co of America, 83 Gulf Building, Pittsburgh 19, Pa.* For a variety of industrial uses Utilitube made of B50S-0 are said to combine low cost per foot, easy workability and high fatigue strength.

TELLURIUM-COPPER ALLOY — *Chase Brass & Copper Co, Waterbury 20, Conn.* Machinability approaching that of free-cutting brass and electrical conductivity 90% of that of pure copper. The addition of tellurium does not adversely affect the hot-working properties of copper. It may be severely cold-worked, although it is less ductile at room temperatures than pure copper.

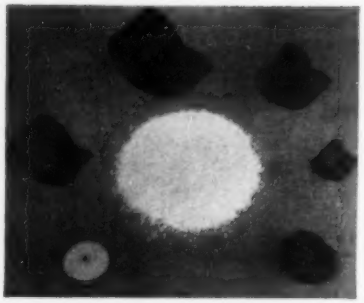
BRONZE—*Chase Brass & Copper Co, Waterbury 20, Conn.* Phosnic bronze is a high-copper alloy containing nickel and phosphorus that makes it well suited for manufacture of springs, clips, screws, and many parts where the combination of high strength, high electrical or thermo conductivity, and good workability are required.

BRONZE—*Chase Brass & Copper Co, Waterbury 20, Conn.* Telnic Bronze, a copper-base alloy is suitable for hardening by heat treatment hot working or forging without loss of good electrical conductivity, due to accurately proportioned amounts of nickel and phosphorous which it contains. Good machinability, equal to 80% of free-cutting brass.

BRONZE ALLOY—*Handy & Harman, 82 Fulton St, New York 38, N Y.* Containing 94% copper and 6% silver is produced in round wire, 0.160 dia down to magnet wire, and in flat wire of equivalent cross-section area with a maximum width of ½-in. Applications include spring parts.

BEARING BLUE — *Dayton Rogers Mfg Co, Minneapolis 7, Minn.* Used for spotting, scraping, and fitting machine parts, is put up in handy 4-oz. cans. It is so compounded that it will not dry.

BEARING MATERIAL—*Dixon Lubricating Saddle Co, Bristol, R I.* Requires no lubrication and is claimed to outperform plastic, metallic, and other bearing materials. Known as Rulon, it withstands temperatures up to 500 F, is chemically inert, and cannot be attacked by any process material.



NYLON PARTS—*The National Polymer Products, Inc, Box 422, Reading, Pa.* Nylon powder has a particle size below microns. It is suitable for cold pressing and sintering techniques similar to those practiced in powder metallurgy. Known as Nylasint 66, the powder is similar to the FM-10001 grade of nylon used in molding.

NYLON—*Polymer Corp of Pennsylvania, Reading, Pa.* Can now be continuously extruded in round-rod sizes of ⅜ to 2 in. dia; square or hex-shaped rods with cross-sectional areas from 0.110 to 3.142 in. Heavy-walled nylon tubing is also available with from 1¼ to 4 in. OD, min ID of ¾, and wall of ¼ in.

TUBING—*Tube Reducing Corp, Wallington, NJ.* Rockrite process for cold-sizing tubes by compression instead of tension also produces finished tubing for cylinder applications. Closer tolerances, better machinability, and superior finishes of compression-formed tubing are claimed.

CENTRIFUGAL-CAST TUBING — *Peter A Frasse and Co, Inc, 17 Grand St, New York 13, N Y.* Made in sizes ranging from 2 to 50 in. OD, with wall thicknesses from ⅛ to 4 in. Acipco tubes can be had in lengths up to 16 ft. Tubing is made in any standard or non-standard analysis.

PLASTIC LAMINATE — *Synthane Corp, Oaks, Pa.* Flame-retardant feature is said to have no detrimental effect on punching or other machining properties.

CHROME CARBIDE—*Carboloy Dept, General Electric Co, Detroit 32, Mich.* Grade 608 Chrome Carbide has extra-high resistance to corrosion, erosion, and abrasion. Made by powder metallurgy, it has a density half that of tungsten carbide, a coefficient of thermal expansion approximately the same as steel, is completely non-magnetic, and has extreme resistance to high-temperature oxidation.

DIAMOND MATRIX—*Precision Diamond Tool Co, 102 S Grove St, Elgin, Ill.* P. S. M. matrix has the following physical characteristics: 1) The coefficient of expansion equals that of the diamond, 2) It wets the diamond, 3) The hardness is 80 Rb.

FLUX—*Farrelloy Co, 1245 N 26th St, Philadelphia 21, Pa.* For treating slag, removing impurities and reconverting to metal the dross of tin, lead, cadmium, zinc and antimony. Slago contains an agent in its formula for toning the metal and imparting a clean, spider-web appearance.

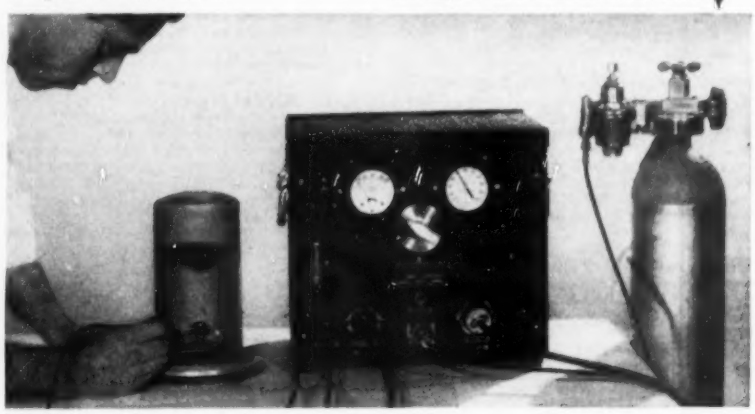
STRIPPER—*Enthone Inc, Dept AM, 442 Elm St, New Haven, Conn.* For rapid dissolving of tin, lead, and tin-lead alloys is used in water in a concentration of one lb per gal. With the mixture heated to from 160 to 180 F. Thicknesses of the order of 0.005 to 0.010 in. are removed in one hour.

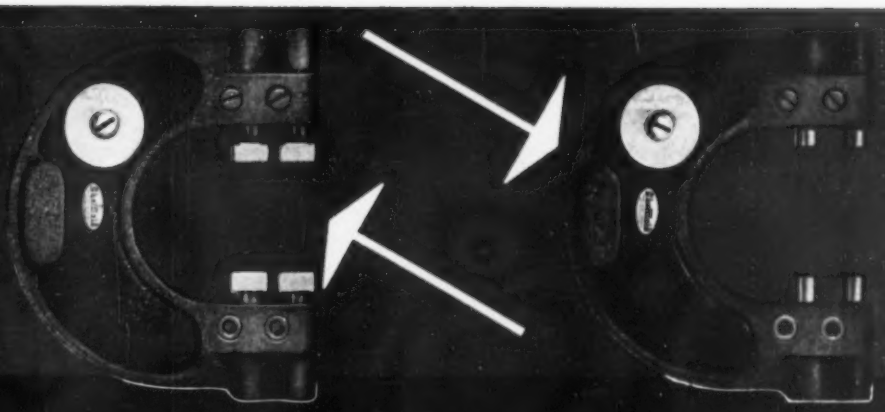
CORROSION TREATMENT — *Silver Star Chemical Corp, 58 Watts St, New York 13, N Y.* For aluminum and its alloys, it is said to afford superior corrosion resistance and good organic-coating adherence.

FLAME-PLATING — *Linde Air Products Co, Div Union Carbide & Carbon Corp, 30 E 42nd St, New York 17, N Y.* Tungsten carbide, with properties claimed equivalent or superior to those of the sintered variety, and other powdered metals, can be coated on any metal in thicknesses from 0.0005 to 0.020 in. by a new Linde process called "flame plating." The coating is neither diluted nor alloyed with the base metal. Bond is mechanical.

METAL REMOVAL PROCESS—*Metalloid Corp, Huntington, Ind.* Metalloid X-20, a chemical compound, is said to increase cutting-tool life and speeds and feeds in any metal-removing process. The compound acts to limit the movement of the atoms in the crystal lattice of the metal when it is being cut. It functions by reducing and limiting the quantity of heat generated by the plastic flow of the metal during the cutting operation.

CUTTING PROCESS—*S S White Industrial Div, 10 E 40th St, New York 16, N Y.* Cutting process performed by the Airbrasive unit involves use of a high-velocity stream of gas-propelled abrasive particles directed against a work surface. Stream is propelled through a sintered tungsten-carbide nozzle; it travels at approximately 1100 fps with an initial dia of 0.018 in., resulting in fast and accurate cuts.





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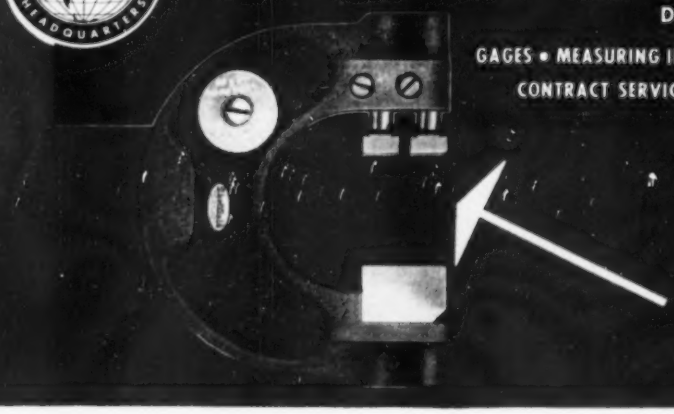
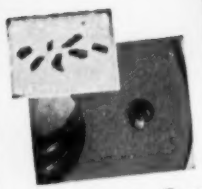


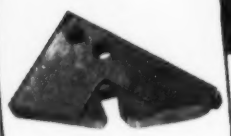
METAL DISINTEGRATION

and what it can do for you . . .

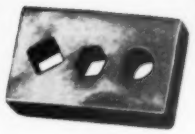


Remove Broken Taps fast without distortion

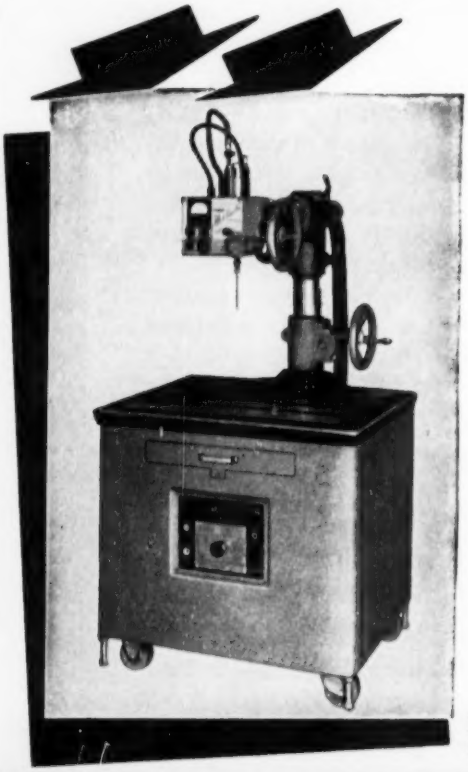
Cut oil holes in hardened gears without annealing



Cut dovetails in hardened dies



Cut any shape hole in cemented carbides



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American Machinist REFERENCE BOOK SHEET

Stock Pushers for Dies

BY PETER BALSELLS

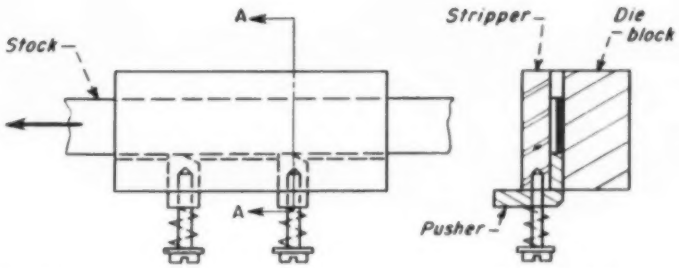

Fig. 1 Section A-A

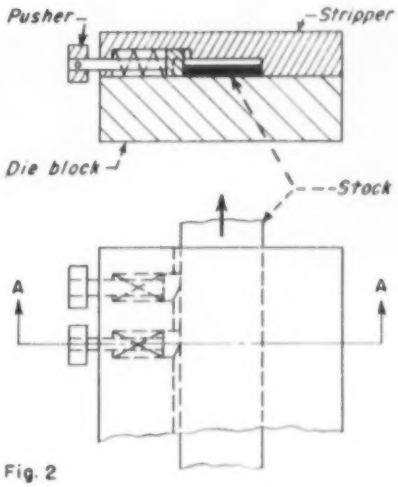

Fig. 2

Purpose of a pusher is to guide the stock while it is moved through the die, and to hold the material in position during die operation. In progressive and blanking dies, the stock is fed through a slot in the stripper plate. As a rule, two or more pushers are mounted in the stripper plate near the piercing and blanking punches

Most widely used types of strippers are shown in Figs. 1 and 2. Always mount these types on the stripper plate to avoid variation in action from grinding the die block. A round corner at the end of the pusher, where it contacts the stock, facilitates movement of the material.

A more positive "push" is provided by the pusher shown in Fig. 3. This device exerts pressure on the stock just before and during operation of the die. The mechanism is mounted on both the top and bottom die members. Principal parts are: angle plate *A*, which pivots on pin *D*, the sliding plate *B*, an adjustable setscrew *G* with locknut, and the plate *E*. As the ram descends, plate *A* strikes *B* and tends to swing left. But spring *C* acts to push *A* to the right until arrested by screw *G*. At the same time plate *B* moves right to hold the stock against the stripper. Clearance of 1/32 in. between plate *A* and screw *G* is usually satisfactory.

Although the pusher in Fig. 4 is the same type as in Fig. 1, it is a special application and is attached to the punch. When the punch descends, the pusher slides over the material and prevents stock movement during forming.

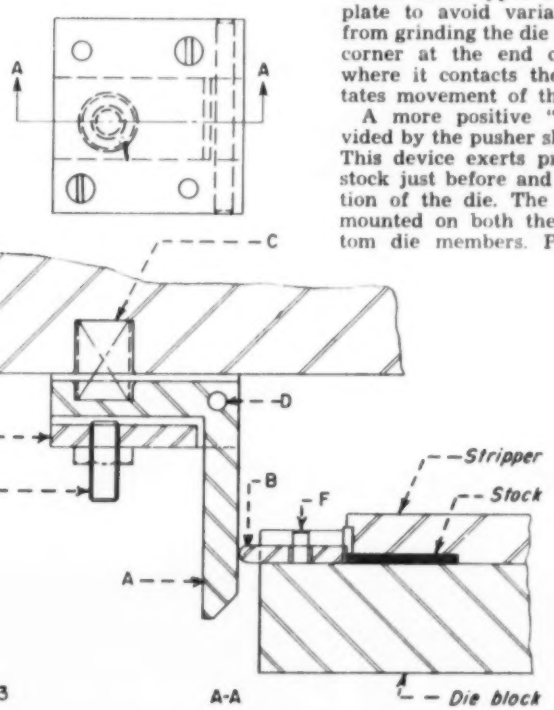

Fig. 3 A-A

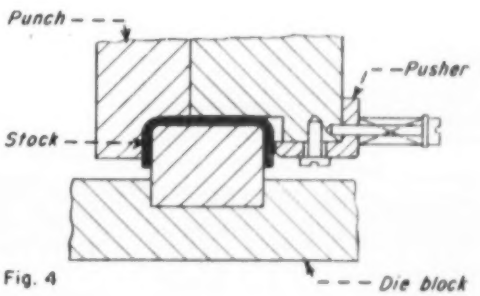

Fig. 4

WRITE FOR BULLETIN No. 521

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FAST POSITIVE LOCKING SCREW (STANDARD)

STEEL FINGER POSITIVE GRIP

CARBIDE TIP (MODIFIED STANDARD)

HIGH SPEED STEEL ANVIL

HOLD DOWN SCREW (STANDARD)

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Use higher speeds.
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Eliminate shank grinding.
Eliminate brazing of tips.
Cut replacement costs.
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FORTY STANDARD SIZES

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AFFILIATED WITH
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LEXINGTON, KENTUCKY

Working Ranges of Grinders

A proposed American Standard developed jointly by the NMTBA, SAE, Metal Cutting Tool Institute and the ASME. To be published by the American Society of Mechanical Engineers 29 West 39th St., New York 18.

Plain Cylindrical Grinders

Scope. This standard applies to all swings of plain cylindrical grinders up to and including the 36 in. size (diameter).

Definition in Size. The size of a cylindrical grinder shall be the nominal swing over the table and the nominal distance between centers, in inches.

Wheel-Hole Sizes. On all sizes of plain cylindrical grinding machines, 5-, 8-, 12- and 20-in. dia of hole shall be considered standard. It will be noted that where the 8-in. hole size is included as standard it is to be considered as applying to present and old designs of machines. In the design of all new machines, 5-, 12-, and 20- in. dia are to be considered standard sizes and every effort made to confine design to these sizes.

Swing. The actual swing shall be less than 1 in. greater than the standard nominal swing, regardless of the length, up to and including the 16-in. swing. On the 20-in. swing and larger machines the actual swing shall be less than 1½ in. greater than the standard nominal swing, regardless of length. It should be noted that 1 in. allowance refers to diameter and not radius; in other words, a 16-in. machine may legitimately swing work of a diameter of 16.999 in. but no more, and be within the standard. A 20-in. machine may legitimately swing work 21.499 in. but no more.

Length. Length shall be measured as the distance between the faceplate on the headstock and the center receiving end of the footstock spindle, such measurement to be taken with the headstock and footstock flush with the ends of the table upon which they are mounted and with the spindle of the footstock extended toward the headstock 1 in. from the extreme remote or back position of the foot-stock spindle. Actual length shall be the standard nominal length, plus half the standard nominal swing. The tolerance of the actual length shall not exceed one-sixteenth of the standard nominal swing. For instance, the length of a 10 x 48 in. machine is calculated as:

Standard nominal length	48 in.
Plus ½ of standard nominal swing (10 in.)	5 in.
Tolerance, 1/16 of 10 in.	⅝ in.
Maximum actual length, including tolerance	53⅝ in.

Nominal Swing. The standard nominal swing shall be 3, 4, 6, 10, 14, 16, 20, 24, 28, 32, and 36 in. It should be noted that the size of the machine described in this rule relates to the diameter of the work possible to swing in the machine, and not to be radius of swing.

Nominal Length. The standard nominal lengths for all plain cylindrical grinding machines shall be 12, 18, 30, 36, 48, 72 in., and longer by intervals of 2 ft. The length shall be related to the swing as follows:

Swing in Inches	Length in Inches
3	12, 18
4	12, 18
6	18, 30
10	18, 30, 36, 48, 72, and longer by intervals of 2 ft
14	18, 30, 36, 48, 72, and longer by intervals of 2 ft
16	36, 48, 72, and longer by intervals of 2 ft
20	96 and longer by intervals of 2 ft
24	96 and longer by intervals of 2 ft
28	96 and longer by intervals of 2 ft
32	96 and longer by intervals of 2 ft
36	96 and longer by intervals of 2 ft

Surface Grinders (Horizontal Reciprocating Table)

Scope. This standard applies to all sizes of reciprocating table surface grinders having horizontal spindles.

Definition of Size. The size of a surface grinder of the reciprocating table type shall be the dimensions of the table working surface.

Wheel-Sleeve Diameters. The standard diameters for wheel sleeves in grinding wheels shall be: 1¼, 3, 5, 8, and 12 in.

Width of Working Surface. The width of table working surface shall be standardized at 5, 6, 8, 10, 12, 16, and 20 in.

Length of Working Surface. The length of table working surface shall be standardized at 12, 18, 24, 36, 48, 60, and 72 in., and in increments of 24 in. above 72 in.

Longitudinal Travel. The maximum longitudinal travel shall be not more than the length of table working surface, plus half the diameter of the standard wheel, plus 1 in.

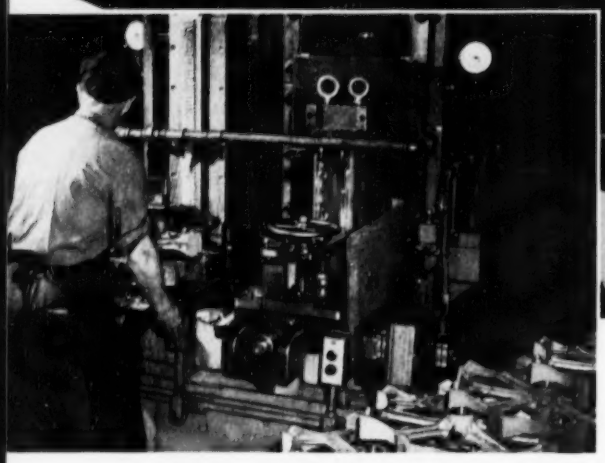
Transverse Travel. The maximum transverse travel shall not be more than the standard width of table working surface, plus width of standard wheel, plus ½ in.

Vertical Travel. Maximum distance from top of table to center of spindle shall not be greater than the following amounts:

Working Surface Width, In.	Vertical Distance to Center of Spindle, In.
5	14¼*
6	14½
8	17⅛
10	20⅛
12	23⅛
16	27⅛
20	35⅛

** For tilting head this distance becomes 15⅝ in.*

MASSEY-HARRIS maintains the only full-scale test track of its type in the implement industry. The track gives these combines more punishment in hours than normal service does in years.



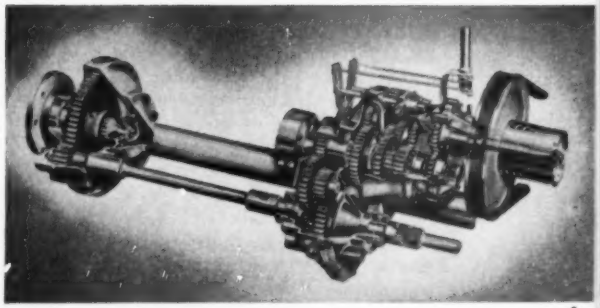
SUNOCO EMULSIFYING CUTTING OILS are used in machining many precision parts. Being broached here are cylinder ends which hold the thresher bars. It is their function to maintain the thresher bars in close alignment with the concave bars to provide efficient operation.

MANY PARTS OF NEW MASSEY-HARRIS COMBINES MACHINED WITH SUN CUTTING OILS

The new Massey-Harris Self-Propelled Combines are precision mechanisms. They are as perfect as a century of experience, modern engineering and production can make them. Sunoco Emulsifying Cutting Oils are used in machining close tolerance parts; Sunicut Cutting Oils are used where an emulsifying oil is not suitable.

"Test it on the track—prove it in the field." That's the Massey-Harris way of insuring the quality of their products. Sun products play an important part in maintaining their high standards.

To learn the right cutting oils and lubricants for your job, consult a Sun representative. You will find his services practical, reliable and complete. Write or call SUN OIL COMPANY, Philadelphia 3, Pa.



SUN LUBRICANTS are used in many of these self-propelled combines for gear and crankcase lubrication. Massey-Harris selected these Sun products because they meet their unusually high standards.

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Metal-Powder Sintered Bearings

Tentative Standard 16-52T issued by the Metal Powder Association 420 Lexington Ave., New York 17.

This standard covers sintered, metal-power, oil-impregnated bearings of two types and four classes:

Type I, Bronze Base:[1]
- Class A, Copper-Tin
- Class B, Copper-Lead-Tin.

Type II, Iron Base:[2]
- Class A, Iron-Carbon
- Class B, Iron-Copper

Basis of Purchase—Orders for material under these specifications shall include the following information:

1. Type
2. Dimensions[3]
3. Certification

Chemical Requirements—The material shall conform to the requirements as to chemical composition as prescribed in Table II.

Density—The density of bearings supplied fully impregnated with lubricant shall be within the limits prescribed below for the type and class specified.

TABLE I—DENSITY REQUIREMENTS

TYPE	CLASS	MIN.	MAX.
I	A	6.4	6.8
	B	6.5	6.9
II	A	5.7	6.1
	B	5.8	6.2

Density shall be calculated as follows:

$$D = \frac{B}{B - C}$$

where:

D = density in grams per cu cm

B = weight of oil-impregnated sample in grams,[4] and

C = weight of oil-impregnated sample suspended in water in grams.[4]

When a bearing is to be impregnated for the purpose of determining weights B and C prescribed above either of the following two procedures may be used:

1. The specimen shall be immersed for at least 4 hr in oil (viscosity of approximately 200 sec Saybolt Universal at 100 F), held at a temperature of 180 ± 10 F, and then cooled to room temperature by immersion in oil at room temperature.

2. The pressure over the specimen after immersion in oil at room temperature shall be reduced from atmospheric pressure to not more than 2 in. of mercury pressure for 30 min. by a suitable evacuating method, after which the pressure shall be allowed to increase to atmospheric pressure for 10 min., the specimen remaining immersed in the oil held at room temperature during the entire period.

Porosity—Porosity in terms of inter-connected void space by volume shall be not less than 18% for all classes when calculated as follows:

$$P = \frac{B - A}{(B - C) \times S} \times 100$$

where:

P = porosity by volume of interconnected void space, %

A = weight of lubricant-free sample in grams,[5]

B = weight of oil-impregnated sample in grams,[5, 6]

C = weight of oil-impregnated sample immersed in water in grams[5, 6]

S = specific gravity of impregnant at test temperature.

Samples which are to be freed of lubricant for porosity determination shall be extracted in a Soxhlet apparatus of suitable size using toluol or petroleum ether as a solvent. After extraction, residual solvent shall be removed by heating samples for 1 hr at 250 F. Alternate extraction and drying shall be continued until the dry weight is constant to 0.1%.

Surface porosity shall be determined by heating the specimen as received to a temperature not exceeding 300 F for a period of not more than 5 min. during which time oil shall exude uniformly from the bearing surface.

Radial Crushing Strength—Radial crushing strength shall not be less than the value calculated as follows:

$$P = \frac{KLT^2}{D - T}$$

where:

P = radial crushing strength, lb.

D = outside diameter of bearing, in.

T = wall thickness of bearing, in.

L = bearing length, in.

K = strength constant as shown below for the type specified.

STRENGTH CONSTANTS

TYPE	K (STRENGTH CONSTANT)
I (Classes A and B)	22,500
II (Classes A and B)	40,000

Radial crushing strength shall be determined by compressing the test specimen between two flat surfaces, the direction of the load being normal to the longitudinal axis of the specimen. The point at which the load drops due to the first crack shall be considered the crushing strength of plain bearings.

TABLE II—CHEMICAL REQUIREMENTS FOR METAL-POWDER SINTERED BEARINGS

	TYPE I		TYPE II	
	CLASS A	CLASS B	CLASS A	CLASS B
Copper, %	87.5 to 90.5	82.6 to 88.5		5.0 to 30.0†
Iron, %			95.0 min.	remainder†
Tin, %	9.5 to 10.5	9.5 to 10.5		
Lead, %		2.0 to 4.0		
Zinc, max., %		0.75		
Nickel, max., %		0.35		
Antimony, max., %		0.25		
Carbon, %	1.75 max.*	1.75 max.*	.05 to 2.0	
Total other elements, max., %	0.5	0.5	3.0	3.0

* *Commonly graphite. A maximum of 1½% of another type of solid lubricant may be substituted when authorized by the purchaser.*

† *Total of iron plus copper shall be 97% minimum.*

These tentative specifications were prepared by the American Society for Testing Material's Committee B-9 on Metal PowJers and Metal Powder Products.

[1] *The compositions included in Type I are intended to be equivalent so far as application is concerned, the different compositions representing the products supplied by different manufacturers for the same service.*

[2] *The copper content of Class B may vary over rather wide limits.*

[3] *Dimensional tolerances are given in MPA Standard 14-51T.*

[4] *Weights shall be determined to within 0.10%. The effect of the surface tension of water in weighing the test specimen may be minimized by addition of a wetting agent to the water.*

[5] *Weights shall be determined to the nearest 0.10%.*

[6] *When bearings are purchased impregnated they should be weighed as received for determining values at B and C.*

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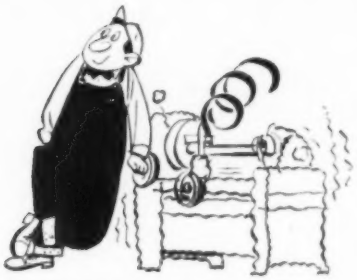

Depth-of-Cut Effects

EFFECTS OF DEPTH OF CUT on surface finish and hardness have recently been studied in England. In all cases of machining mild steel with HSS, carbides and ceramic tools, surface finish fluctuated considerably; the carbides and ceramics giving considerably better finishes than HSS at depths of cut above 0.050 in. All tools caused much work-hardening, the HSS at 0.4-in. depth of cut increasing VPN from 140 to 210 and extending about 0.020 in. below the surface.

On dural, neither surface finish nor work-hardening varied much. On 60:40 brass, surface texture from the HSS tool was poor; but with carbide tools intermediate. Carbide and ceramic tools caused steady increase in hardness as cut depth increased, but the HSS peaked at 0.170-in. depth of cut, falling almost to the initial value at 0.400 in. Micro-stress levels shown by X-ray confirmed test results.

To Describe Products

HERE ARE the adjectives which describe, according to Ross Gilmore, president of Superior Steel & Malleable Castings Co, Benton Harbor, Mich, what various departments are interested in with relation to a product:

Sales—new
Phoduction—simplified
Accounting—cheaper
Engineering—improved
Inspection—better
Shipping—more
Stockholders—profitable

All these ends, he says, can be achieved through good product development.

Corrugated Shop

A RECENT SWING through the South reaffirms the tremendous industrial development there and points up some major differences. One new plant cost a bit over $2 a sq ft, against almost five times that in the North. The answer is corrugated sheet-iron walls and roof, with no necessity for building heating. For maximum efficiency, however, air conditioning would be required, which would raise costs somewhat...

One non-metalworking plant is just completing a campaign to make all employees stockholders. Results have been highly successful. The general plan is to sell stock at the market through the men's club, which arranges financing where needed so men can buy outright, have salary deductions, or take secured loans. As a department reaches 100% in stock ownership, the club stages a dinner-dance to celebrate the occasion. Thus far, three-quarters of the departments have made the grade. General results are, of course, greater employee interest in operations and higher efficiency.

Comrades

TWO RECENT ITEMS anent Russia seem to associate themselves. First is an extract from the Soviet labor-front organ, "Trud," in which a writer named Spiridonov, in advancing the theory that labor does better under Communism, says that we Americans indulge in an inhuman speedup that ruins the health of workers. He says an American firm named Baley-Lainen has installed lathes that require the worker to use both hands and feet—and in addition have a special yoke that goes around the worker's neck so he can move the "longitudinal support." The lubricating mechanism is over the worker's head, so, if he fails to perform the required operations, oil comes down on his head.

A survey of readers of *The Machinist*, organ of the International Assn of Machinists (AFL) indicates that none of them had ever heard of such a lathe. Nor have we ever seen one.

Meantime the *Detroit News* published Dec 17 a feature story on Whitney Smart of that city, who makes automobiles impregnable to grenades, land mines, and bullets. He made one for Stalin, which cost $10,000 plus the cost of the limousine. Unfortunately, his products have never failed thus far.

Don't Tell Too Much

WE SEE, again and again, the suggestion that an employee should never be given a job without having it explained clearly. That follows the old Army routine of giving instructions to an enlisted man, then asking him to repeat them. To an officer, however, the instructions are given; then he is asked if he has any questions. We mention this only to point out that the business of always explaining may on occasion do more harm than good. We've known cases in which the employee was smart enough that he liked to figure things out for himself—and was offended by getting all the details. And there is the case of the young fellows doing ultra-precise work who, if told how precise the job is, would be so concerned they wouldn't be able to maintain the precision—or would try to improve on the methods. Either would spell trouble in making top-precision optical instruments for the Navy, or so we're told.

Young men coming along in the shop or tool engineering seem to grasp essentials faster than their elders did at the same age. So why stifle enthusiasm with labored instructions on every small point?

News of Metalworking

BRITISH GET OFF-SHORE CONTRACT FOR 500 TANKS

LONDON — A $90-million contract for Britain's Centurion tanks, largest off-shore purchase order to date, was signed recently between US Army Ordnance and the British Ministry of Supply. The tanks will go to Denmark and Holland.

Contracts for 500 of the 52-ton tanks will go to Vickers-Armstrong and three other large assemblers. Sub-contracts will be awarded to Jaguar and Rover for engines, and to 105 other firms.

The tank order is the first contract to be let to Britain out of the $1 billion set aside for off-shore purchases under provisions of the 1952-53 foreign aid bill.

ARMY TESTS POWER TOOLS FOR FRONT LINE USE

FORT BELVOIR, Va.—A portable electric tool set capable of making front line repairs to tanks and other combat vehicles is currently undergoing tests here by Army Engineers.

Major power tool manufacturers have cooperated with the Army in designing a set of high-cycle electric power tools that is expected to increase field repair efficiency greatly. The set has been tested in Korea and Europe on several types of jobs and has proved effective.

The set consists of two chain saws, two circular saws, a ¼-in. and a 1¼-in. capacity drill, two impact wrenches, impact hammer, floodlights, and a portable 180-cycle, 220-volt, 3-phase 2½ kw generator plus accessories, mounted on a ¼-ton trailer. Weighing only 1370 lb, unit can be dropped to troops by plane.

REVOKE FINISHED STEEL STOPPAGE MEASURE

WASHINGTON — National Production Authority has revoked an emergency measure of last August 1 whereby stocks of certain finished steel products were frozen for 15 days after receipt by warehouses.

The measure, known as Direction 6 to Order M-1, was put into effect soon after conclusion of the summer work stoppage in the steel industry as a means of expediting military and atomic steel orders.

Vance Committee Production Lines

WASHINGTON — Tooling up of standby production lines, capable of turning out large quantities of weapons quickly in case of national emergency, is advocated by the Advisory Committee on Production Equipment (Vance Committee) in its final report to Defense Mobilizer Henry H Fowler.

Creation of this new mobilization capacity would be substituted for stockpiling of guns, tanks, planes and other military items which would rapidly become obsolete.

Vance Committee estimates that $1-2 billion of machine tools would have to be produced to carry out its policy. It's impossible to predict an exact figure until the armed services come up with "realistic mobilization requirements" of guns, planes, tanks, other end-items.

To give meaning to its words, the committee cites these figures: Expenditure of $500 million for long lead-time machine tools (metal-cutting and metal-forming machines) to be ready in an emergency would increase aircraft production $18 billion in the first two years of war.

This greatly enlarged capacity to produce would substantially reduce the number of planes that otherwise would have to be built and stockpiled. Savings in required outlay of funds prior to actual mobilization are in ratio of 36 to 1.

Basic assumption of the committee is that the nation must maintain a high level of military preparedness over a period of years. The challenge then is to get the greatest degree of national security with the least expenditure of money and the smallest drain on the country's resources.

The way to do this is to create a larger capacity to produce military weapons, and keep it in such condition that it can be quickly expanded in the event of war.

In most armament production programs, initial cost of facilities is small compared with cost of manufacturing end-items for a stockpile. Cost of facilities for certain ammuni-

WORLD'S FIRST DELTA WING SEAPLANE, the "Sea Dart," is launched for its pre-flight trial run in San Diego Bay. Built by Consolidated Vultee for the Navy, the triangle-shaped jet fighter is designed to expand the air-defense perimeter of fleets at sea and bases ashore. "Elevons" on wing trailing edge replace conventional ailerons and elevators.

Advocates Standby for War Materiel

tion components is equivalent to cost of full production for only six weeks.

Most armament production facilities (machine tools) are not subject to obsolescence at any time, as are the weapons themselves, the committee states. Moreover, the cost of modernizing facilities to make improved end-items is only a fraction of the expense of scrapping and replacing obsolete end-items.

and in a state of readiness. This country must avoid any national policy that would impair military end-item production lines."

In constantly modernizing its production equipment, the government must avoid forced liquidation of machine tools in competition with normal production of the machine tool industry. The Committee says "government actions along those lines have had disastrous effects on this industry (machine tools) in the past."

forth by the committee. After all, Congress must vote the money to put the policy into effect. It also may have to provide legal authority to purchase or lease plants and other production facilities to maintain standby production capacity for national defense materiel.

Expect Ike's Support

General Eisenhower's staff was not consulted about the report by the Vance Committee, but it is believed that the program advocated by the committee is sufficiently non-partisan that the new administration will support it. Secretary of Defense Wilson has been a strong champion of the dual-purpose plant tooled for armament production in an emergency and for output of peacetime goods in normal times.

Real Test Upcoming

Real test of what will happen to the Vance Committee program is likely to come when Congress acts upon the 1954 military budget. This budget contains $500 million for the building of long-lead-time machine tools for specific end-items.

The Vance Committee Report was signed by Harold Vance, chairman of Studebaker, as chairman, Admiral W H P Blandy, Manly Fleischmann, Lt Gen LeRoy Lutes, Rear Admiral Lewis L Strauss, and Lt Gen K B Wolfe. Thomas J Craven also signed as executive secretary.

VANCE COMMITTEE'S PROPOSED PROGRAM

1) **Pentagon to complete as soon as possible a list of military end-items needed in case of mobilization. This list would be under continuous review and would be revised as often as necessary.**
2) **Machine tools to be built without delay in line with actual emergency production needs of the armed services.**
3) **These machine tools (earmarked for specific production lines) to be kept in up-to-date condition "Ready for rapid activation."**
4) **Where capacity to produce heavy machine tools is inadequate, the government will try to get private industry to expand. But if needed capacity "is found to be commercially non-supportable, the government itself must create and maintain it."**
5) **Congress will be asked to confirm and support this policy, and Pentagon and other executive agencies to take essential action to comply with it.**

SEE PAGE 119 FOR PROGRAM'S EFFECT ON MACHINE TOOL INDUSTRY.

Realistic Evaluation Needed

Exactly how much production capacity is needed for the mobilization base depends upon a realistic evaluation of the guns, aircraft, ammunition and other hard goods required for full mobilization. Vance Committee reports, however, that requirements currently being used at the Pentagon for military production planning are unrealistic—"not within national capabilities," as they call for larger quantities of end-items than supplies of material and manpower could support.

The committee decided not to wait for the Pentagon to complete a realistic list of end-items before issuing its final report: "We cannot stress too strongly the necessity for keeping the US industrial machine unimpaired and for keeping production equipment modernized

Inventory Management

Management of government inventory has had a tremendous bearing on the financial condition of the production equipment industry and could affect the industry even to the point of jeopardizing its existence, the committee concludes.

"A healthy machine tool industry is a key factor in the nation's ability to adopt and apply this policy of establishing and maintaining production capacity necessary for an adequate mobilization base," the committee bluntly declares.

Congressional Support Urged

The Vance Committee stresses the importance of a declaration by Congress in support of the policy set

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ERRATA

The new General Electric fractional-hp motor plant reported in last issue's Plant Expansion (AM—Jan 5, '53, p 160) is located at Linton, Indiana, not Michigan as was erroneously reported.

Metalworking Abroad

(By McGraw-Hill World News)

Brazilian-Japanese combine for manufacture of such items as electrical equipment, buses, diesel engines and street cars is a possibility, with Japanese industrialists investing 40% of the capital and receiving authorization to transfer 20% of annual profits.

British carbon steel shortage is seriously affecting drop forgers, who are finding it impossible to meet a large percentage of their orders, a survey of 70 British drop forging firms reveals.

Turkey's military production has been doubled by MSA allocations in recent months. The allocations were made to build agricultural equipment in Turkish arsenals and consequent production improvements have upped military output along with civilian.

German auto production in 1952 is believed to have set an all-time record—420,000 motor vehicles, including 300,000 passenger cars. Previous high figure was 1938's total of 357,000 vehicles. Trade circles state, however, that the domestic market for passenger cars and motorcycles is reaching the saturation point.

Brazil's electrical equipment industry recently received encouragement from President Vargas, who decreed (1) high priority for turbines and other heavy equipment, (2) expanded manufacturing and a cutback in imports, (3) channeling of all federal orders to home industries, and (4) expansion of materials sources and technical services.

Shipments to Europe Reach New Peak As Arms Aid Program Hits Stride

WASHINGTON — Arms shipments to Europe are beginning to roll in increasing volume. Latest figures show that shipments during October hit a peak value of $329 million—highest since the program got its start in March, 1950.

Since then, more than 5 million tons of tanks, planes, artillery, ammunition and spare parts have been shipped to our allies. Over 17,000 tanks and combat vehicles—enough for about 34 divisions—have gone overseas; nearly 2300 airplanes have been shipped or flown over; and about 93,000 trucks, jeeps, and other motor vehicles have gone to NATO and friendly Asiatic nations.

Shipments to Total $14 Billion

Since the start of the Arms Aid Program about 90 days before the outbreak of hostilities in Korea, Congress has earmarked $16.5 billion for mutual security purposes. A little over $14 billion is destined for weapons to be made here and shipped abroad.

An additional $800 million, originally scheduled for end items, has been transferred by the military to economic aid, under the provisions of the Mutual Security Act. Another $1.6 billion will ultimately go into off shore procurement—financing NATO arms output from European manufacturers.

Most Contracts Let

Of the $14 billion earmarked for domestic arms production for NATO, the military has already let contracts totalling about $11.5 billion. By the end of June, all but a negligible amount of the balance will have been translated into firmed-up contracts.

Despite charges that US arms shipments to allies have been consistently behind schedule, Pentagon sources say European nations have experienced no delay in activation of training of units through our failure to meet arms shipment schedules. In many cases, shipments have been held up in US warehouses awaiting assurance from our military advisors in Europe that forces there are ready for them.

Nearly all of the 2300 airplanes shipped abroad have been fighter bombers or medium bombers. Under original terms of the NATO Rearmament Program, member countries were to supply their own interceptor aircraft. Except under a joint agreement with Canada, where US and Canadian firms turn out F-86 Sabre jets for England, no US interceptors have been sent to European forces.

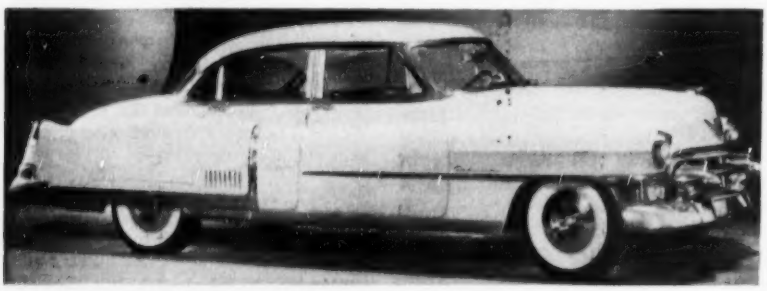
Off-Shore Jet Production

To counteract interceptor deficiency, US military experts have let off shore procurement contracts with British and French firms for production of jet interceptors. Two types going into production are the British Swift and the French Mystere Mark IV. Negotiations are also underway with the Netherlands and Italy for similar contracts.

Pentagon spokesmen say that off shore procurement contracts for jet interceptors will be largely "pump priming" to get production underway. Once full production is hit, the United States will withdraw and the individual countries will take over.

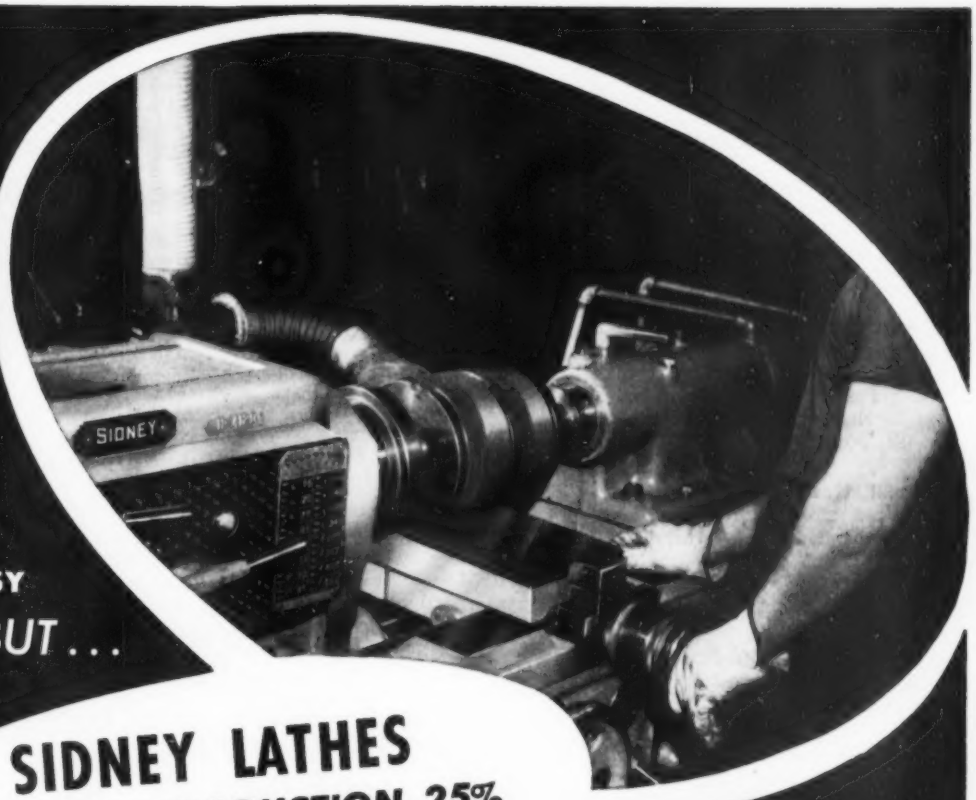
Red Tape Delays Contracts

Biggest trouble in the Military Aid Program thus far has been in re-jiggering funds once appropriations are let. Congressional cuts require that US military advisory groups overseas cut back individual programs—a process that takes at least three months. Then comes a review by the Pentagon and translation into procurement programs, with the result that contracts are seldom let until six or nine months after Congress votes the money, and a log jam of contracts occurs at fiscal year's end.



CADILLAC MAINTAINS ITS FINE TRADITION with the 1953 60 Special sedan. Powered by a 210 hp engine with 8.25 to 1 compression ratio and high valve lifts, this model achieves greater gas economy and acceleration. Air conditioning, new this year, is optional

FORM TURNING PISTON RINGS ISN'T EASY *BUT . . .*



SIDNEY LATHES

INCREASED PRODUCTION 25% AND IMPROVED QUALITY FOR PERFECT CIRCLE

When you consider the millions and millions of piston rings produced by PERFECT CIRCLE you can understand what a 25% increase can mean in the total output. And think also of the infinite precision necessary to achieve the required smoothness on which so much depends.

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Here's What PERFECT CIRCLE says about SIDNEY LATHES:

"Your Sidney Lathes were built with special attachments for irregular inner diameter boring and outer diameter contour turning and slitting. *Production of surface feet per minute increased about 25%.* At the same time the quality of the product was improved because of the ability of the Sidney equipment to hold closer tolerances. These factors resulted in increased production per man hour, improved quality and enabled PERFECT CIRCLE to meet delivery dates."

PUT YOUR PROBLEM UP TO SIDNEY . . . WE'LL HELP SOLVE IT.

Write for details or contact nearest Sidney representative

SIDNEY MACHINE TOOL COMPANY • SIDNEY, OHIO

BUILDERS OF PRECISION MACHINERY SINCE 1904

Plant Expansions

Armco Steel Corp will add a cold reduction mill, continuous cold strip pickler, and light and heavy gage Zincgrip lines to its Ashland, Ky, plant. Estimated cost: $12 million.

E B Sewall Mfg Co, St. Paul, plans a 17,000 sq ft addition to its gear and sprocket factory, including a main office and entrance. Company's address is changed to 705 Raymond Ave., St. Paul.

Industrial Washing Machine Corp has moved from New Brunswick, N J, to expanded manufacturing facilities at 32 Main St., Matawan, N J.

Hydro-Aire, Inc, recently completed a 75,000 sq ft addition to its aircraft accessories plant in Burbank, Calif, where it will also manufacture turbomachinery.

Consolidated Industries, Inc, West Cheshire, Conn, is making its third expansion within a year with the acquisition of the Tobrin Tool Co, Plantsville, Conn, where it will manufacture forged aircraft parts.

Amana Refrigeration, Inc, Amana, Iowa, will up its home freezer manufacturing space from 170,000 to 370,000 sq ft at a cost of $3.5 million.

Cutler-Hammer, Inc, Milwaukee, recently purchased a 500-ft long plant from its next door neighbor, Nesco, Inc, as part of its long-range consolidation and expansion program.

Dodge Div, Chrysler Corp, has awarded contracts for construction of a 68,000 sq ft addition to its San Leandro, Calif, automobile assembly plant. The company will also manufacture aircraft propellers for the Navy and Air Force in the new building.

Reed-Prentice Corp, Worcester, Mass, recently completed a new factory building, providing 23,000 additional sq ft for the assembly of large vertical milling machines.

Associated Machines, Inc, Lancaster, Ohio, has purchased three large buildings and adjacent land in that city and will begin manufacture of screw machine parts and die-castings next summer.

Surveys Show Capital Investment To Continue High Through '55

WASHINGTON—Shape of things to come, at least for the next three years, is forecast by Secretary of Commerce Charles Sawyer, who bases his predictions of continued prosperity on industry-wide surveys of capital investment plans, projected defense spending and anticipated consumer buying power through 1955.

Three-Year Outlook

Looking into business's crystal ball, Commerce Dept economists see the next three years this way:

- **For 1953** — Good business for everyone, particularly automotive, aircraft and appliance manufacturers. Contributing factors: high industry outlay for new plant and equipment, steady consumer buying power, increased defense spending.
- **For 1954** — Slightly less certainty of continued prosperity than for '53, because of possible downswing in business.
- **For 1955** — The critical point when defense spending will drop and the gap in industrial production must be filled by increased consumer demand for products, new and old.
- **Overall trends** — Barring a major international crisis, US output is expected to reach a total of $365 billion in 1955, in terms of 1951 prices. This represents an increase of 8% over 1952, and would raise the nation's income level to $240 billion, 7% more than the '51 figure. Defense spending will rise to $60 billion annually by 1954, but will drop to between $50 and $55 billion by 1955 if present military goals are fulfilled. Initiative and planning on the part of industry, plus continued high buying power, should offset the decline.

Market Report

Secretary of Commerce Sawyer's forecast, published in a recent report, *Markets After the Defense Expansion*, is based on Commerce Dept surveys of more than 2,000 leading US industrial and commercial firms and takes into account such factors as capital investment plans, projected increases in defense spending, continuation of present tax rates, and minor business fluctuations.

Capital Investment High

The first of two surveys, dealing with 1953 capital investment plans of some 2,000 top US firms, reveals an estimated expenditure of $26.3 billion on plant, plant equipment and expansion in 1953, only slightly less than 1952's $26.9 billion.

A secondary survey of 84 major companies, representing one-third of US business investment, shows only a slight downward trend in projected capital investment for 1954 and 1955. The surveyed firms plan to spend 85% of their 1952 total in '54 and 80% in '55.

Copies of *Markets After the Defense Expansion* are available at $.60 each from US Dept of Commerce Field Offices.

REPRESENTING 1429 YEARS OF SERVICE to the industry are these 46 members of Cleveland Punch & Shear Works Co's Quarter Century Club, gathered for their annual meeting in the Hotel Carter, Cleveland. Five new members were inducted at the meeting

Get the most out of your

LELAND-GIFFORD DRILLING MACHINES

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LUBRICATE AS INSTRUCTED

Like all fine machinery, your Leland-Gifford drilling machines deserve the best care — including proper lubrication. Over-oiling can be as harmful as neglecting to oil. Adopt a daily and weekly lubricating routine, always using moderation. Better still, follow the recommendations in your instruction manual.

A small point? Yes . . . but important! Leland-Gifford Drilling Machines are built as trouble-free as master craftsmanship and long experience can make them . . . with totally enclosed motors, spline lubrication wipers, oil mist lubricated spindle bearings and many other features to insure lasting precision and safe, dependable operation. But neglect or abuse can impair the performance of even the finest equipment. With reasonable care and maintenance, your Leland-Gifford Drilling Machines will keep on producing accurate holes year after year. Remember, you are making a valuable contribution to the defense effort when you take the best possible care of your production equipment.

***SAVE TIME*— CONTACT THE OFFICE NEAREST YOU**

LELAND-GIFFORD

Drilling Machines

WORCESTER 1, MASSACHUSETTS, U.S.A.

Business Items

Food Machinery and Chemical Corp, San Jose, Calif, recently purchased **Mowamatic Corp,** Mount Vernon, N Y, manufacturers of power lawn mowers, for an undisclosed price.

ACF-Brill Motors Co, Philadelphia, will recapitalize its stock. Plans are to refinance $3 million of notes due May 30 by issuing a like amount of 5% 10-year convertible sinking fund debentures in exchange.

Kilbourne & Jacobs Mfg Co, 37-year-old Columbus, Ohio, manufacturers of truck and crane equipment, is considering dissolution. Its next-door neighbor, **Jeffrey Mfg Co,** may expand into the K & J plant.

Westinghouse Electric Corp will build an ultra-modern plant for the manufacture of welding electrodes and brazing alloys near Montevallo, Ala, 38 miles south of Birmingham. The first of its kind in the South, the new plant will supply electrodes and alloys to South and Pacific Coast states by early 1954.

Fenn Mfg Co, Hartford, Conn, will construct a $1,250,000 aircraft plants part at Newington, Conn. The plant, scheduled for fall, 1953, completion, will manufacture rotor heads and transmissions.

Cleveland Instrument Co, Inc, is the new name of **Graham-Mintel Instrument Co, Cleveland.** Location, personnel, products and facilities are unchanged.

Aerovox Corp, New Bedford, Mass, has purchased the entire outstanding stock of **Acme Electronics, Inc,** Pasadena, Calif. Acme's two plants will continue to manufacture power and radio supplies as a division of Aerovox.

Westinghouse Electric Corp's Columbus, Ohio, plant now under construction will switch from its original plans for Navy jet aircraft production to manufacture of civilian goods.

Ferro Foundry & Machine Co, Cleveland, recently purchased the plant and assets of **John Harsch Bronze & Foundry Co,** Cleveland, thereby adding non-ferrous casting to its gray iron casting operations.

Truman Budget Goes Heavy On Military Goods Spending

WASHINGTON — President Truman's budget for the fiscal year 1954 calls for a whopping big $72.9 billion in new obligational authority and expenditures of $78.6 billions. If the legislation called for by the President were passed as it stands, fiscal year 1954 could wind up with a $9.9 billion net deficit.

Military Budget High

Of primary interest to hard goods manufacturers is the budget for the military services, which calls for expenditures of $46.3 billions—almost 60% of total government spending—and new obligational authority of $41.5 billion. (Obligational authority is the amount of new money requested for the fiscal year.) Thus the 1954 budget figure includes some appropriations from previous years in addition to new money.

Key figures for the military budget are those for major procurement and production, generally taken to represent the amount for new hard goods contracting.

$14.2 Billion for Hard Goods

The Defense Dept has asked for about $14.2 billion for new hard goods contracts. It breaks down this way: $8.2 billion for aircraft, $1.1 billion for ships, and $4.9 billion for such other items as tanks, ammunition, some guided missiles, trucks and automotive equipment. All of these figures will be increased when the Defense Dept is given an estimated $5.6 billion for hard goods buying. Thus far no breakdown is available for the arms aid figure requested by the Defense Dept.

Also requested by President Truman is an additional $1.8 billion for military research and development—most of it for guided missile production contracts. His message also carried a request for $600 million for the industrial mobilization program.

Chances are manufacturers will hear a lot about this increase—up a half billion from last year. About $500 million is earmarked for purchase of plants, tools and industrial equipment as recommended in the Vance Committee Report (see page 290). Balance of funds will be used for reserve plant and equipment.

Procurement Funds Down . . .

President Truman's message bears out a trend that became evident by the end of the last fiscal year—Congress has already appropriated most of the funds needed initially to buy weapons and hard goods — that's why major procurement and production funds are down about $5 billion from 1953.

. . . But Buying Is Up

Expenditures for this category are, however, continuing to rise and reflect an increasing rate of weapons deliveries to the military. Budget estimate is that the military will spend $17.4 billion foir major weapons in fiscal 1954—$1 billion more than the fiscal '53 figure, and $6 billion more than the appropriation for fiscal 1952.

"GREATEST IN 50 YEARS" IS BUICK'S BOAST, and to prove it here is the hardtop Roadmaster Riviera, featuring a 188-hp valve-in-head V-8 engine, twin turbine Dynaflow and power brakes that cut braking effort 75%. New also are front end, headlamps and rear fenders

Rome-Turney water-cooled condenser coil. Tube is ⅝" O.D., .042" ga., bent on a 1⅜" centerline diameter. Soldered helical fins are .135" wide, spaced 14 turns to the inch. Other types of heat exchanger coils are also shown. Rome-Turney forms coils out of tube up to 40 feet long, without joints.

For Copper Tube that can be BENT

Rome-Turney sees REVERE

Most of the Revere Metals are fabricated by usual methods into conventional products. Some of them, however, appear on the market in forms that are unusual and possess special advantages. Take these helical-finned copper coils produced by the Rome-Turney Radiator Co., Rome, N. Y. It takes extra skill to produce coils with such small radii. The company can produce the coils shown on a commercial basis, for use in air conditioning apparatus, air compressors, and general heating and cooling applications where compactness plus high heat transfer rates are essential.

How it is possible to make such tight turns is Rome-Turney's secret. Revere does not share in it, nor does Revere want to reveal a secret of its own, which is how we turn out copper tube in a special bending temper for an application such as this. All we can say is that the two methods dovetail very nicely. If you need copper tube that can be bent easily, and offers you as well the advantages of corrosion resistance, high heat transfer, easy joinings, see Revere. We also make copper pipe, tube in copper alloys, aluminum alloys, and electric welded steel tube. If required, the Technical Advisory Service will gladly collaborate with you, as it has with Rome-Turney, on selection and specification matters. Get in touch with the nearest Revere Sales Office.

REVERE

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Founded by Paul Revere in 1801

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.— Sales Offices in Principal Cities, Distributors Everywhere

SEE REVERE'S "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY

Distributors Named

Larry Hammond Co, 1551 North 35th St, Milwaukee, is now sales representative for Intoco Sales Co's line of machine tools.

Smith Booth Usher Co, Los Angeles, will act as the industrial sales division of Western Machinery Co, San Francisco, in the Los Angeles area.

Towne Industrial Equipment Co, Inc, has been named by Clark Equipment Co, Battle Creek, Mich, as sales representative for its fork truck line in 129 Texas counties.

Gibney-Coffman Corp, 2107 Kensington Ave, Buffalo, has been named regional representative for Brad Foote Gear Works and Superior Steel & Malleable Castings Co.

Cleco Div, Reed Roller Bit Co, Houston, Texas, announces appointment of **Grant & Co,** Los Angeles; **H N Crowder, Jr, Co,** Allentown, Pa; and **Ponsford Equipment Co,** El Paso, Texas, as regional distributors for its line of air tools.

Donald Ross and Partners, Ltd, London, England, has been licensed to manufacture and sell Aronson Machine Co's line of precision welding positioners in western Europe, Great Britain, India, Australia and South America.

Hyster Co, Portland, Ore, and Danville, Ill, announces the appointment of the following distributors and retailers: **Hyster Co** retail sales, Long Island City, N Y; **Materials Handling Equipment, Inc,** Peoria, Ill; **Fuchs-Clayton Machinery Co,** Omaha.

New Fuels, Planes, Weapons Hold Spotlight at Annual SAE Meet

DETROIT—Development of integrated weapons systems for national defense, application of atomic energy to electric power generation, and new fuels and power plants for super-sonic planes are a few of the irons engineerdom has in the fire, it was revealed here at the Society of Automotive Engineers' Annual Meeting January 12-16.

Other topics under discussion in the five-day meet included surface treatments to prevent wear, engineering approaches to service problems, turbine-powered aircraft, design and engineering details of several new automotive engines, and the possibility of replacing metal auto bodies with glass-reinforced plastics.

A two-way television broadcast of field testing of military motor truck axles took place January 12 in a hookup between a session at Detroit's Rackham Memorial, scene of the meet, and Timken-Detroit Axle Co's plant.

Robert Cass, White Motor Co, Cleveland, was elected president of SAE for the coming year.

Air Force Briefs Small Business On Contract Procurement

WASHINGTON — Air Force procurement specialists met January 14 with representatives of civic, business and industrial organizations in 27 cities to explain how small businesses can obtain contracts.

Objectives of the nationwide meetings were twofold: to restate the Air Force small business program to these groups; and to ask their aid in contacting small firms capable of carrying out aircraft contracts.

Highlighting each of the 27 meetings was a premiere showing of a 22-minute sound film explaining how the small businessman can seek Air Force business with a minimum of time, money and effort. Organizational heads attending the meetings were in turn asked to arrange for future showings of the films to their member components.

At these showings, the Air Force will supply a small business specialist to answer queries from local firms and give on the spot information to potential Air Force suppliers.

Canadian Power Situation Tight

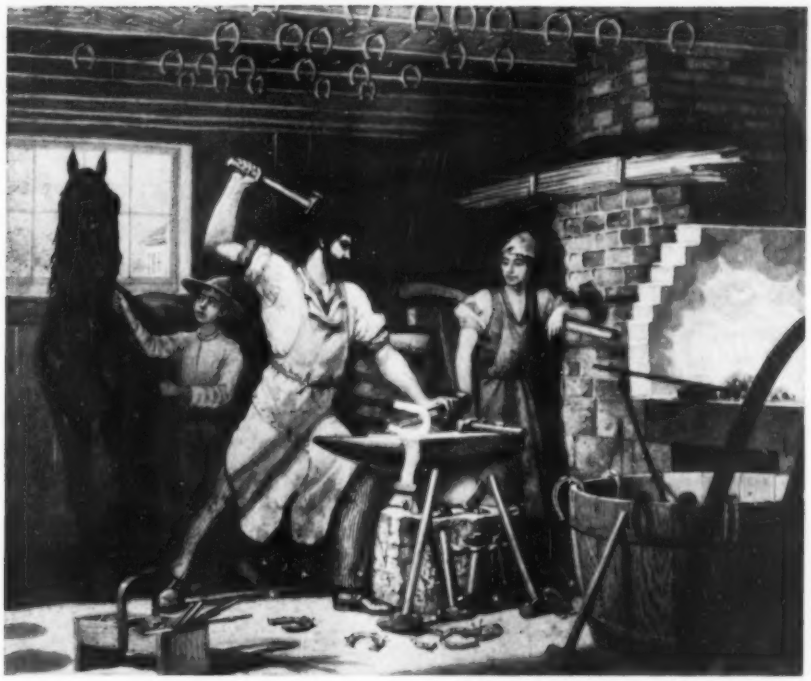
OTTAWA—An additional 20-25,000 workers will be needed to meet expanding requirements of the Canadian defense production program by the end of next year, the National Advisory Council on Manpower revealed at a recent two-day meeting here. The bulk of these workers will be required by the aircraft, weapons, ammunition and electronics industries, the Council said. Currently, the most serious shortage is in highly-skilled technicians.

Last year, employment in the plants of defense contractors and subcontractors increased by roughly 50,000 workers, or 25 per cent of the total personnel engaged in war work.

Ford Tank Output Doubled

DETROIT—Tank engine output at Ford's River Rouge Plant has been doubled by order of Army Ordnance. Production increase will supply replacement engines and parts for the M-4 General Sherman tank.

MACHINIST DADS WATCH SONS PLAY IN ROSE BOWL, courtesy of Gisholt Machine Co, Madison, Wis, who gave Veteran Machinists Lawrence Esser (second, left) and Olin J Gulseth (third, left) an all-expense trip to Pasadena to see their sons, Norbert Esser (left) and Wendell Gulseth play for Wisconsin. Festive occasion was tempered somewhat by Wisconsin's 7-0 loss



From the Beale Collection of Early Americana

Horseshoe Iron...to Aircraft Steel

Ryerson Completes 110 Years of Service

When Joseph Ryerson opened his first small iron store, 110 years ago, the clang of the blacksmith's anvil was a dominant note in America's metalworking industry. Blacksmiths, boiler makers and other metalworking pioneers were the iron store's first customers. Their orders for horseshoe and boiler iron, axles, plow steel, spikes, etc. formed the basis of our business.

Today that small iron store has grown to be the world's largest steel service organization with fifteen great plants strategically located across the nation.

On the occasion of our 110th Anniversary, we are grateful for our thousands of customers whose orders through the years testify to the Ryerson tradition of trustworthy service. And we are thankful for the privilege of living and working in a free country where initiative and service are rewarded.

From your nearby Ryerson steel plant flows every kind of steel in every shape and size to meet the needs of industry. Ryerson shipments cover everything from structural shapes and plates of carbon steel and bright sheets of stainless to high strength aircraft-quality alloys.

When you need steel, any kind, any quantity, cut to order and delivered promptly we will be pleased to have you call us.

PRINCIPAL PRODUCTS IN STOCK

CARBON STEEL BARS—Hot rolled and cold finished

ALLOYS—Hot rolled, cold finished, heat treated. Tool steel.

STRUCTURALS—Channels, angles, beams, etc.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

PLATES—Many types including Inland 4-Way Safety Plate

REINFORCING STEEL—Bars and accessories, wire mesh, etc.

SHEETS—Hot and cold rolled, many types and coatings

BABBIT METAL—Lead base.

RYERTEX—Plastic bearing.

TUBING—Seamless and welded, mechanical and boiler tubes

MACHINERY & TOOLS—Metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

COME BACK, LITTLE SHAPER

NEW YORK — Fellows Gear Shaper Co's old No. 51 is missing. It's the second gear shaper made by the company (1896), and was on display in Fellows' lobby until it was generously loaned to the New York Museum of Science and Industry when it opened in Radio City. The museum was moved some time later to Broadway, and the shaper went along with the exhibits. Shortly after this, the museum was closed; most of the displays being auctioned, largely by Avalon Galleries. Somehow the gear shaper disappeared, too.

If Robert P Shaw, former director of the museum, or anyone else knows of the whereabouts of the shaper, Fellows would like to be informed. Company feeling is that the shaper should be on educational display, and not scrapped, as may have happened if it went to someone unfamiliar with its history. Address information to **AMERICAN MACHINIST** or Fellows Gear Shaper Co.

NTDMA Official Foresees Good Year For Tool and Die Industry

CLEVELAND — The contract tool and die industry can look forward to at least one year of continued good business, according to George S Eaton, executive secretary, National Tool & Die Manufacturers Association.

Growing demand for special tooling for civilian products is expected to offset any foreseeable decline in defense contracts, which today make up 50 to 85% of special tooling output, Mr Eaton said. Any step-up in Korean activity would necessitate an even heavier load on the industry, he added.

As controlled materials become more plentiful, manufacturers of civilian goods will need special tooling for new models, a situation roughly similar to that existing after World War II, when pent-up demand for new metal products created a great surge of retooling requirements.

At present, it would be difficult for tool and die shops to expand their output, which has more than doubled since 1947, Mr Eaton says. Record output of $700 million, estimated for 1952, has kept shops operating 55 hours a week or more and the demand for skilled mechanics is growing constantly . . . to a point where some letup in pressure for deliveries would be welcome.

Backlog of unfilled orders continues at high levels, although it has declined gradually since its all-time peak in 1951. Today, the backlog represents about three months' operation, unusually high for the tool and die industry. Thus, Mr Eaton says, the industry is assured of a good year in '53, and probably in 1954.

Machine Toolmakers Join Standards Group

NEW YORK—The machine-tool industry has formally elected to participate in the work of the International Organization for Standards (ISO), and groups interested in national standards for cylindrical limits and fits are expected to follow suit shortly, according to Admiral F Hussey, Jr, managing director, American Standards Association.

Rearmament Prospects Boom Japan's Metalworking Industries

TOKYO—Japanese industry is riding high on an unprecedented wave of prosperity, caused by heavy demand for Korean war materiel, plus incipient defense rearming of Japan.

The country's munitions industry is already turning out mortars, carbine barrels and ammunition for Korea, and is being readied for a top-priority role in defense rearmament. Industrialists estimate Japan can produce 5,500 machine guns per month within a year, 9,000 rifles monthly within 6 months, 4 million artillery shells and 15 million bullets annually, plus a variety of anti-tank guns, mortars and bazookas.

To meet these production quotas, Japan must import several million dollars' worth of machine tools to replace equipment destroyed during early days of the Occupation. Also needed are technicians capable of building defense plants and turning out modern arms.

Aircraft Production Revival

The US Far East Air Force is negotiating with Japanese factories for overhaul of American combat planes as the first step toward revival of aircraft production. Air Force experts, however, believe it may be five years before Japan can produce jet combat planes.

Has Its Drawbacks

Although the forthcoming defense rearmament program is expected to boom most metalworking industries, Japanese economists expect it will eventually lower the nation's standard of living. The reason: Japan's already-scant hydroelectric power and raw materials supply will be channeled into defense output, to the detriment of civilian hard goods production.

CHEVROLET'S LOW, SWEEPING LINES FOR '53 are evident in the "Two-Ten" sedan. Completely redesigned, 1953 Chevrolets offer increased performance, new contours, enlarged front and rear vision, greater comfort

SOUTH BEND 2-H TURRET LATHE

Keeps Costs Down on Precision Parts

This precision-built turret lathe is designed specifically for the machining of accurate, duplicate parts. It is especially suited for large-volume, second operations that require close tolerances and smooth finishes.

The wide ranges of its 48 power cross feeds, 48 power longitudinal feeds, 48 thread cutting feeds and 96 power turret feeds provide combinations that permit maximum cutting efficiency through the entire machining cycle. And conveniently placed controls make machine handling effortless.

Now is the time to find out how this precision turret lathe can help keep down the cost of your small, precision parts.

MODEL 2-H PRECISION TURRET LATHE

Available with 6′ or 7′ bed, 28¼″ or 40½″ maximum spindle nose to turret face distance; 1″ collet capacity; 1⅜″ hole through spindle. Turret has adjustable feed stop for each tool, power feed trips out at stop setting. Double tool cross slide, 9¼″ travel.

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☐ 10″ to 16-24″ FLOOR LATHES

☐ ½″ and 1″ Collet TURRET LATHES

☐ 14″ DRILL PRESSES

☐ 7″ BENCH SHAPERS

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Louis Allis, Jr

C G Skidmore

Hans K Reitz

Edward G Petherick

Names in the News

Louis Allis, Jr, former vice president in charge of sales for Louis Allis Co, has been elected vice president of the company, and will join his brother, **John W Allis,** in management of the firm. **C G Skidmore,** formerly sales manager of the company, was elected to take the position of vice president in charge of sales. Both men are members of the company's executive committee.

David R Miller, chief of the gage section of National Bureau of Standards, has retired after 44 years of service with the bureau. Mr Miller contributed to the interference methods of measuring gage blocks optically, and has worked on developments in screw threads; threaded products, and gages for checking them. He is the author of several technical publications including articles and handbooks.

Arthur W Wadsworth, president of Wadsworth Watch Case Co, has retired, though he will become honorary chairman of the board of the firm. His brother, **Randolph L Wadsworth,** has become president in his place. Both men are sons of the founder of the company, which produces compacts and gift items, watch cases, military products, and emblems.

James M Hait has been elected to the board of directors and executive committee of Food Machinery & Chemical Corp, and **Dr Max E Bretschger** has been named a vice president. Mr Hait is vice president in charge of engineering and manager of the company's ordnance div. Dr Bretschger is head of the chemical division of the firm.

Hans K Reitz has been appointed factory manager for Colonial Broach Co, succeeding **William Kukuk,** who has resigned to work on sales of Colonial drill-jig bushings. Mr. Reitz has been superintendent of machine construction for the firm since 1947.

Mundy I Peale, president of Republic Aviation Corp, has been elected chairman of the board of governors of the Aircraft Industries Association for the first six months of 1953. **Oliver P Echols,** chairman of the board of Northrup Aircraft, Inc, was elected chairman for the second half of the year. New president of the association for 1953 is **Admiral DeWitt C Ramsey** (USN retired). Executive committee for the association will be the above three, plus **Frederick C Crawford,** president of Thompson Products, Inc, and **Ira C Eaker,** vice president of Hughes Aircraft Co. **L D Webb** was reelected vice president and Western regional general manager, and **Harrison Brand, Jr,** was reelected secretary-treasurer of the association.

E T Houlihan has been appointed manager of industrial and refrigeration department for Taco Heaters, Inc, moving from a sales-executive capacity in the firm to handle the new department. Other appointments include: **Robert T Angevine,** assistant sales manager, heating-manufacturers packaging equipment; **Howard E Lucas,** regional sales manager for the states of Maryland, N Carolina, S Carolina, Virginia, and Washington, D C; and **William J Sliney,** regional sales manager for southern New Jersey, eastern Pennsylvania, and Delaware.

Edward G Petherick, long-time abrasive engineer for Norton Co on the West Coast, has retired and will be replaced by **Norman R Ekholm,** present abrasive engineer in the Northwest. **Arthur W Cox** will act as abrasive engineer in Mr Ekholm's former territory.

Karl L Mason has been promoted to assistant research director for Caterpillar Tractor Co, advancing from manager of the proving-ground, field-research div. His replacement is **Paul Spennetta,** formerly general supervisor of the proving grounds. Mr. Spennetta will be manager of the proving-grounds div, while **Frank Middleton** will be manager of field research, advancing from the position of general field supervisor. **Norman E Risk** and **Richard S Frank** have been named assistant chief engineers for Caterpillar. Mr Risk will be in charge of design and development supervision for crawler tractors, while Mr Frank will be in charge of design and development of diesel engines. Six other men have been named general supervisors for the company: **George Lundberg, Paul Benner, Carl Kepner, Bill Johnson, Harry Budelier,** and **Bob Bonney.**

H Earle Runion has been appointed production manager of Consolidated Engineering Corp, to be in charge of production schedules, shop assemblies, and liaison between manufacturing and engineering divisions of the company. He formerly headed his own firm of production engineers.

Richard A Modig has been advanced to general sales manager of Holo-Krome Screw Corp from his former position as New England sales—district representative of the firm.

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK

AUTOMATICALLY-LOADED Lo-swing IMP handles various length and diameter bushings

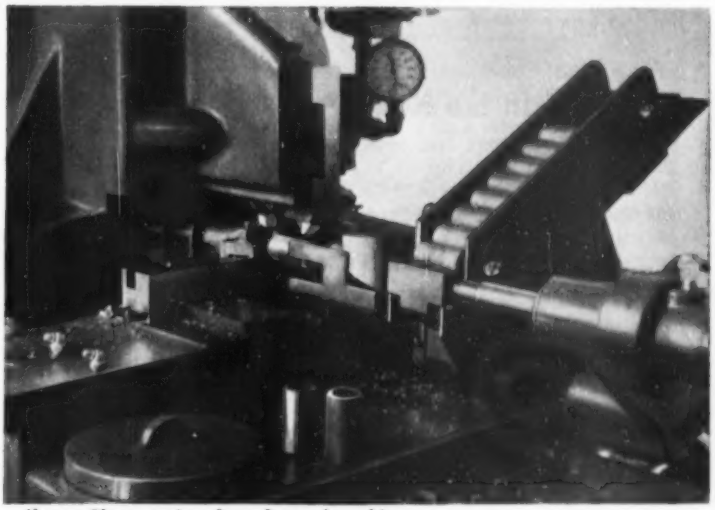
Problem: **Turning and facing *both* ends of a variety of bronze bushings on automatically loaded lathe. Bushings to vary in length and diameter, and to come to machine rough cast with hole broached.**

Solution: **Bushings are loaded onto an expanding arbor by a plunger which picks up the bottom bushing from the inclined chute shown in upper illustration. A movable stop locates the bushing on the arbor and then withdraws to allow tools on the Third Slide (see lower illustration) to face *both* ends of the bushing to length. Simultaneously, the Front carriage tool turns the O. D. A stripper kicks the finished bushing off the arbor and into the unloading chute while tools are returning to starting position.**

When bushings of another diameter are to be turned, ease and quickness in change-over are provided. The operator merely changes the arbor loading plug, makes a quick adjustment to take care of longitudinal tool travel, and resets the tools. If there is sufficient change in bushing diameter to necessitate a different spindle speed, a change of easily-accessible pick-off pulleys makes this a simple operation. The loader chute is made adjustable to accommodate various bushing lengths and diameters.

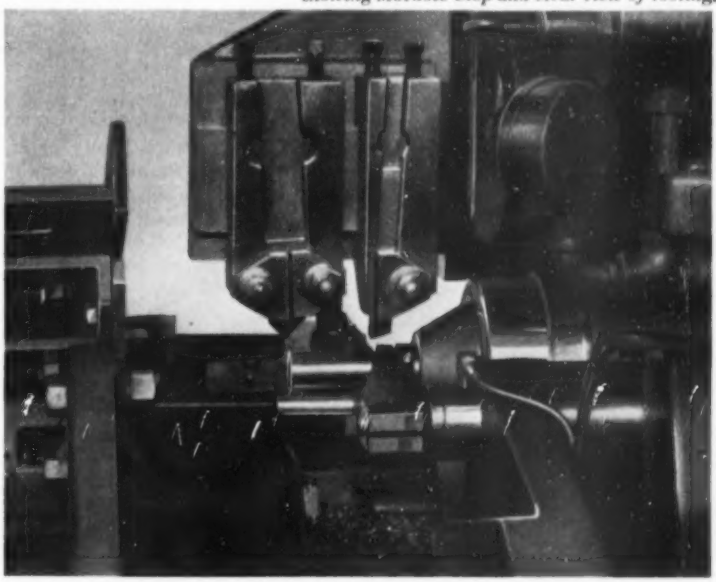
The Lo-swing IMP worked out very well on this job due to the availability of the Third Slide for the facing operations, thus leaving the rear of the machine open for loading and unloading. Tungsten Carbide Tools were used on this job with speeds and feeds set accordingly. Other inherent IMP features, such as rigidity, accuracy at high speeds, and ease of change-over contributed also in large measure to the satisfactory solution of the job.

SENECA FALLS MACHINE CO.
SENECA FALLS, N. Y.



Above: Close-up view from front of machine showing Loader Chute and Loading Plunger.

Below: Close-up view from rear of machine, showing Movable Stop and clear view of tooling.



PRODUCTION COSTS ARE LOWER WITH Lo-swing

Gilbert T Coovert

Arthur S Armstrong

Erwin J Baumrucker

Hubert J McCormick

NAMES in the NEWS

Gilbert T Coovert has been appointed general manager of V & O Press Co, div of Emhart Mfg Co. He joined V & O in 1950 as personnel manager, and has been acting factory manager, factory manager, and assistant general manager.

Arthur S Armstrong has been elected president of Cleveland Twist Drill Co, succeeding **Jacob D Cox,** who is now chairman of the board for the company. Mr. Armstrong has been a service representative and an executive vice president for the firm.

Arthur L Chapman has been appointed vice president in charge of electronics operations for Sylvania Electric Products, Inc, a new post. He has been a vice president of the company for two years.

R G Schrock, vice president of Euclid Electric & Mfg Co, has been advanced to executive vice president of the firm. He has been with the company 30 years, starting as a lathe hand, and working as foreman and superintendent.

Harry W Poole has been appointed director of quality control for Superior Tube Co, changing from Brown Instrument Div of Minneapolis-Honeywell Regulator Co. **Richard L Hoff** has been appointed development metallurgist for the same company, changing from a position as head of welding research at Naval Air Training Station, Philadelphia.

Lee Sekulski, sales manager for Mathews Conveyor Co, has been elected a director of the Conveyor Equipment Manufacturers Assn.

Erwin J Baumrucker has been appointed executive assistant to the executive vice president of Clearing Machine Corp, **J R Bartizal.** He has been acting manager of Clearing's London branch office.

William W Winkler has been elected president of Durant Mfg Co, to succeed his father, **William K Winkler,** who becomes chairman of the board. The elder Mr Winkler has served as president since 1921. The new president has been secretary, vice president, and general manager of the firm.

John W Thees has become works manager of Doehler-Jarvis' Toledo plant No. 1, moving from the Chicago plant. **Charles I Hodgson** has been named as works manager of plant No. 2 in Toledo, moving from the position of chief electrical engineer of the corporation.

Edward M Norton has been named administrative assistant to the manager of Armco Steel Corp's Butler, Pa, plant. **Frank Burdette** has been appointed superintendent of the processing plant, and **Joseph C Slater** has succeeded him as superintendent of the strip-coating and silicon department.

Hugh J Mathews, former assistant to the general manager of Stamford Div, Yale & Towne Mfg Co, has been named plant manager at Stamford. **John E Charleson,** who was superintendent of the finishing department at Stamford, has been appointed plant manager at Lenoir City, Tennessee. Both men will direct all operations at these plants except sales and advertising. The two plants are half of the newly formed Yale Lock & Hardware Div of the company.

Hubert J McCormick, former engineer and conveyor sales representative for Link-Belt Co, has been appointed sales manager for the Caldwell plant of the company. He succeeds **Erwin A Wendell,** who is now on leave.

Dan A Ringis has been named manager of Chrysler Motors Los Angeles plant, succeeding **C C Rowles,** who has shifted to the staff of the operating manager of Plymouth div for special duties. Mr Ringis has been a tool engineer, master mechanic, and special representative for defense projects within Chrysler Corp.

William G Whyte has been appointed assistant to the vice president, United States Steel Co. He has been a field representative and assistant in public relations for the company.

Edgar W Bartz has been appointed Pacific Coast welding supervisor for Westinghouse Electric Corp. He has been active as a welding-application engineer for the company in western industries and shipyards. **Wayland A Heding** has been named welding-application engineer for the Los Angeles office of Westinghouse, moving from a similar position in Milwaukee. **Parker W MacCarthy** has been made manager of the jet-engine section, electrical-appliance engineering dep't, for Westinghouse at Columbus, O. He will deal with design information on jet-engine components. **William B Cott** has been named manager of air-conditioning-application engineering for Westinghouse's Sturtevant div, replacing recently deceased **Tolbert Earl Smith.** Mr Cott has been a district manager for sales of air-conditioning equipment.

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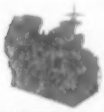
...A KNOW-HOW THAT SPRINGS FROM MANY YEARS OF BUILDING CIRCULAR SAWING MACHINES, BLADES AND BLADE GRINDERS, AND CORRELATING "ALL 3" PROFITABLY ON THE JOB

Motch & Merryweather's unmatched experience in the field of circular sawing brings you a know-how which insures profitable operation — *invariably.* To sign an order for an M. & M. machine is to be sure of complete satisfaction. Your purchase will perform as it should. We will see to that — *invariably.*



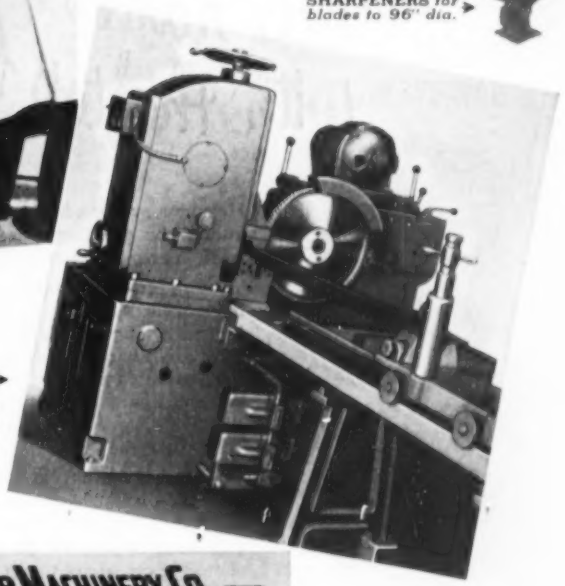
MACHINES *for cutting off to 36" dia.*

CUT-OFF BLADES *up to 96" dia.*

SHARPENERS *for blades to 96" dia.*

MP/SF

Most Production per Square Foot



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Builders Also of Production Milling, Vertical Turning, Automatic and Special Machines

Only M & M builds ALL 3: CIRCULAR SAW, SAW BLADE, BLADE GRINDER

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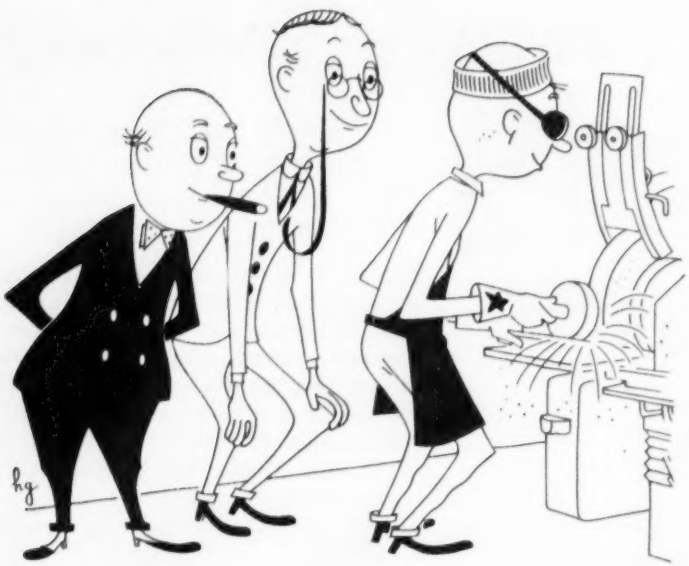
ABRASIVE CO.
Grinding Wheels



An ex-PFC ranks high with the "top brass!"

He's now an *operator* first class, and he sure knows the grinding wheels that make his work "come to attention."

They're Simonds Abrasive Company grinding wheels. And they prove themselves in a big way long before he even uses them. Right in Simonds own plant these wheels must satisfy a practical, rough-minded group of department heads that they're *right* for the job . . . grind fast . . . cut cool . . . and keep their shapes.

This insistence on excellence is the reason why Simonds wheels give top rate results on rough grinding, finishing, sharpening, polishing, cutting-off, etc., . . . and why you should know where to get them.

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ROUND TABLE Discussion

PIGS IS PIGS

How much responsibility has a machinist for keeping his work area in reasonably clean condition? Is this completely the sweeper's job, or will an able worker naturally tend to keep his territory orderly?

IT IS CUSTOMARY in many shops that each worker clean his machine or the bench at which he is working, but the floor is swept by other men.

I agree with the Kansas man that machinists should not do the work assigned to the janitor. It is too expensive to have a tradesman sweep the floor, take care of chips at the machines, or do other kinds of work that belong to the sweepers.

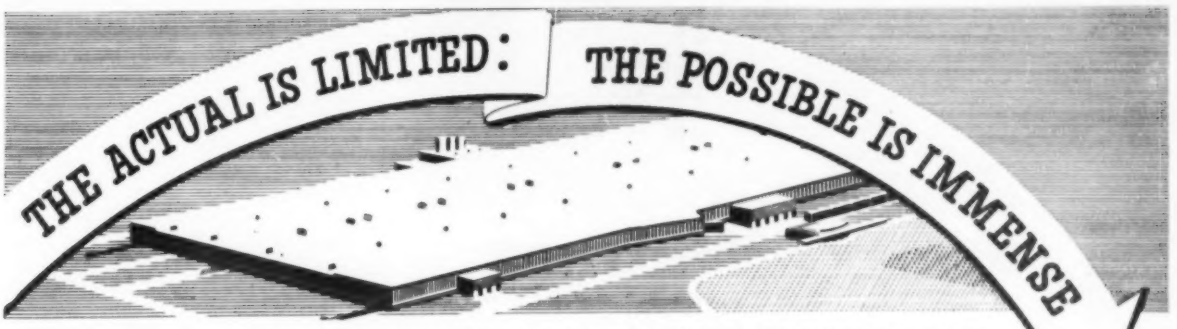
A machinist working at a machine, however, is expected to clean up his own small tools and his machine, and oil them at the same time. These implements are so expensive that they must be treated with due care and experience to preserve their lives as long as possible. Fifteen minutes should be included in each week's production schedule for cleaning up all machines and working benches. When large machine tools are used, one half-hour might be necessary. Cleaning the floor and removing chips is best done after each day's work, otherwise the men engaged in the production are disturbed in their tasks.

Of course, a machinist might, in his own accord when his machine is running on power feed, clean up to keep the dirt a few feet away, but I don't believe this should be stated as his duty.

If Al hired the Kansas man to work as a machinist, he should have told him at the same time that the cleaning up of his working area was part of his job. A maintenance man to sweep the floor? Why, that would be just as bad as the regular machinist doing unqualified work.

The whole question is not a very important one, and should not be stressed too far. But, of course, it also depends much upon how clean the place has been kept in past years.

I remember one shop where I was in charge many years ago that looked as though pigs had been living there for the past 25 years. The first order I directed was to three sweepers to clean up the entire shop. The things found in the accumulated dirt were



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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WELDED STEEL DESIGN CUTS MANUFACTURING COSTS

. . . saves machining, simplifies production

MANY types and sizes of machine components can be produced more efficiently . . . with less material . . . at less cost through welded steel design. From heavy equipment like large presses (Fig. 1 & 2) to small machines (Fig. 3 & 4), proper design in welded steel saves materials, saves labor . . . cuts cost.

Material costs are less with welded steel designs because fewer pounds of metal are required on which less machining and less finishing is necessary. Products have better selling appeal with welded steel's modern appearance.

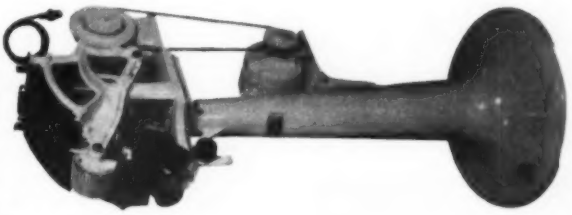

Fig. 4. Original Construction *of marking machine. Had high rejection rate in castings. Required considerable machining and finishing. Weighed 83 pounds.*

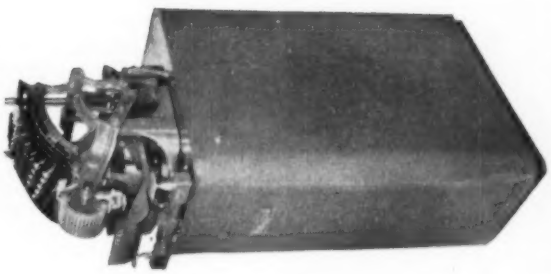

Fig. 3. Welded Design. *Cuts manufacturing cost 25%, weighs 33% less. Cabinet type base is now fabricated from 16 gauge metal and welded in simple fixture. Steel design eliminates entire cost of machining and handling originally required.* Courtesy National Marking Machine Company, Cincinnati, Ohio.

PROPER DESIGN IN WELDED STEEL IMPROVES PRODUCT AND LOWERS COST

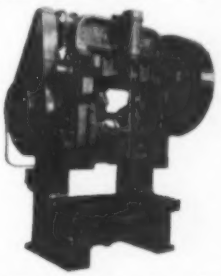

Fig. 1. Original Construction *of multiple punch press. Material cost was $.10 per pound from this manufacturer's own foundry. Weight was 56,000 pounds.*

INCREASES RIGIDITY SAVES MATERIAL

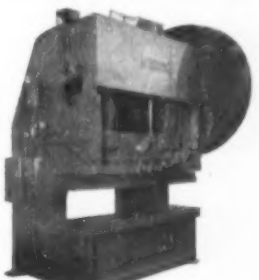

Fig. 2. Welded Steel Design *is actually more rigid than former casting yet weighs only 49,550 pounds. Modern in appearance . . . costs 15% less.* Courtesy Williams-White and Co., Moline, Illinois.

MORE PROOF

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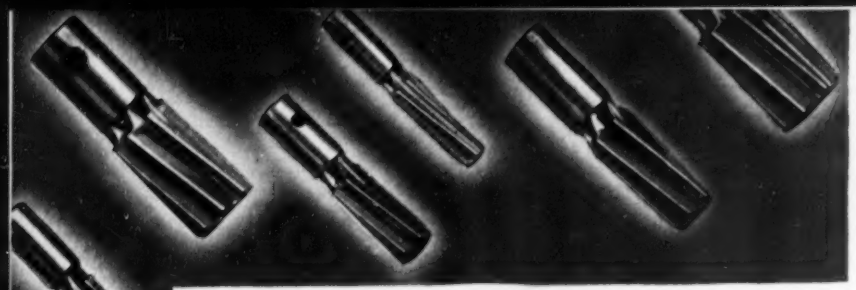

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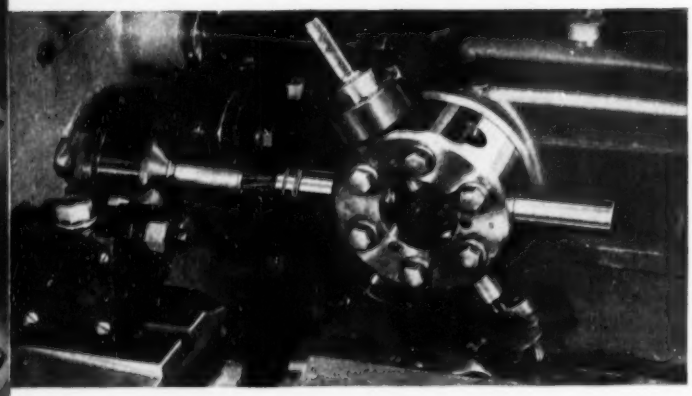
REDUCE TOOLING COSTS...

INCREASE OUTPUT



The "P & W" marking is your assurance of outstanding performance. High speed steel, skillful heat treating and correct design with ample chip clearance mean fast, free cutting performance, long life and low cost. Holes are round, straight and accurately sized. P & W FLOATING HOLDERS are recommended as an additional aid to reaming accuracy.

Any decimal size from .060" to 1.010" can be furnished promptly and inexpensively from extensive stocks of semi-finished hardened blanks. The entire range of 24 basic sizes requires only 6 standardized shanks and 5 overall lengths. Required holders, cam changes and set-up times are all greatly reduced. For complete information, write on your Company letterhead to the Branch Office nearest you — or direct to West Hartford; ask for the new Pratt & Whitney Bulletin No. 552.

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First Choice for Accuracy

CUTTING TOOLS • GAGES • MACHINE TOOLS

astonishing and included several dozens of drills and taps, many screwdrivers, files and hacksaw blades; hundreds of bolts, nuts and washers, and even a small undamaged electric motor.

I agree with Ed to get the sweepers there oftener—once a day after working hours—and let the men hired as machinists do machinist work.

A E Fristedt
Stockholm-Bromma, Sweden

WHO RATES THE BOSS?

Is a foreman-rating card, to be filled out by the shop men, a healthy idea for general morale? Would such a policy result in overboard criticism, or might it not bring to light a few weaknesses which the foreman could easily correct?

I SHOULD THINK that Al's foreman-rating card would indeed knock our old friend Ed for a loop!

The rating one man may give to his foreman could be entirely different from that of another. He's a chameleon at heart ofttimes, not knowing his one-and-a-quarter-six from the hole in a doughnut. I don't think his conclusions would click 0.0001 plus and minus and, therefore, the inaccuracy of his rating would defeat the purpose of its inception. The man could be prejudiced; he could be temperamentally touchy; he could harbor hate for the man on top; or he could be a person unable to distinguish right from wrong. Now these particular things in a person could throw cold water on any scheme of foreman-rating. On top of the various peculiarities of human nature it seems not advisable to permit the worker to evaluate the foreman.

Now that we have plucked the infected feathers from the worker, let us consider the foreman. Executives are not cast from the same mold by any means. Some men passing off as foremen need a considerable amount of checking up, but thank goodness most of the foremen are regular, dependable chaps who are a credit to industry.

A good shop leader is one who has had the necessary practical experience to understand what is required of his men and to see that they carry out his orders. Now, if we are going to give him the September Morn treatment—strip him of his effective rainment (face) and submit him to the penetrating eyes of his subordinates—it is almost a certainty that he is going to be shorn of his power as an executive.

A supervisor who prides himself on his abilities isn't going to like it one bit if he is going to be treated as a cadaver and whittled to pieces by a bunch of vacillating subordinates who invariably delight in panning another just for the hell of it. A foreman who knows his way around has some degree of pride in his capabilities, and anything like a checking up by the men under him is enough to tie his liver into a knot. Especially would this be so were management to undertake to have subordinates express their opinion of him.

We are putting the cart before the horse when we have the workers evaluate the top man. Better do the checking up in a downward direction.

Jack Everett
San Francisco, Calif

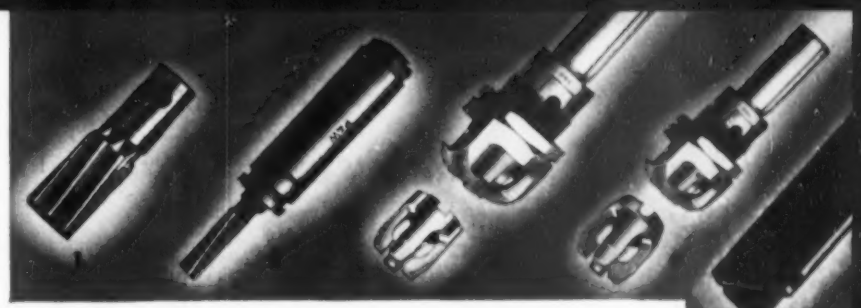
•

WHAT'S THE REASON for raising such a question anyway? Is management dissatisfied with their own appraisal of the foremen they have selected to take care of the work? This is, according to my opinion, an act of terror. And what boss would take that kind of a slap in his face? Certainly not a capable one.

Of course, this is a matter for management to consider. Who else would have the proper knowledge to pass a judgment? Certainly not the majority of workers in the shop. It is true that a foreman may be ignorant and of low character, perhaps also a poor organizer. Many a man in that shop might be able to tell the superintendent what to do in a certain case, but this would be a rare occasion, since most foremen are chosen on previous merits. If foreman-rating cards are to be filled out at Ed's and Al's shop, this shop is over-organized.

If 25 or 50 cards were filled out by men in that shop, they would reflect the contour of as many foremen;

"I think the lift mechanism needs a slight adjustment."



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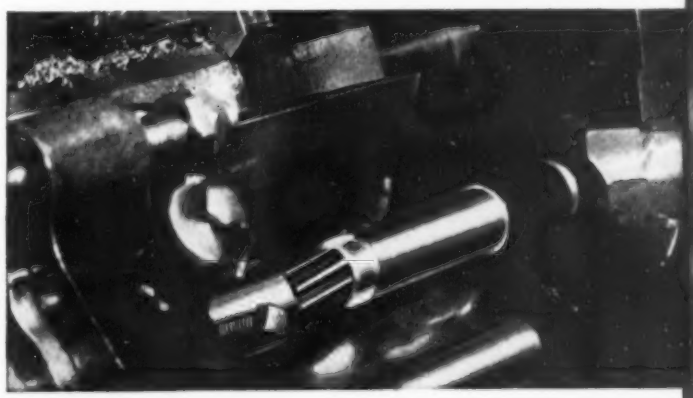
CUTTING TOOLS
ASSURE UNIFORM QUALITY
and DEPENDABLE ACCURACY



Manufactured by the most modern processes from only the finest, selected materials, Pratt & Whitney Screw Machine Cutting Tools bring you the combined advantages of careful, precise metallurgical control and uniform quality — resulting in long tool life at lowest cost.

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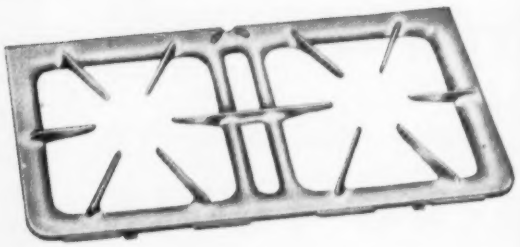
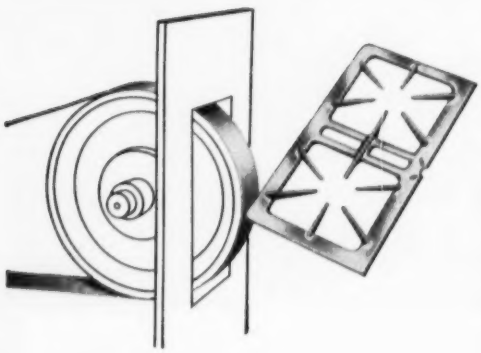
How would you SOLVE IT?

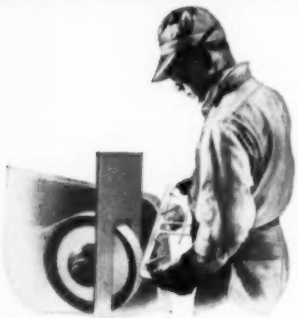


PRODUCTION PROBLEM: To cut unit costs of finishing stove top grids and produce a more uniform finish. (Manufacturer found conventional grinding wheel turned out only 50 units per hour, left unsatisfactory finishes, fatigued operators.)

1 A 3M Representative analyzed Mount Vernon Furnace Company's grinding and finishing operations, and made the following specific recommendation:



2 He advised this company to convert to the 3M Backstand Method using fast-cutting 3M Belts: (#36 Three-M-ite resin bond, size 3" x 132") and special rubber contact wheel.



3 Now this Illinois manufacturer uses the 3M Method to turn out 100 grids an hour (twice as many as previous method!) with more uniform finishes. Grinding is safer. There's less operator fatigue. A 3M Representative can help you reduce your production costs, too. His services are available without cost or obligation.

WANT MORE INFORMATION?

Minnesota Mining & Mfg. Co.
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Return this coupon for additional facts on 3M Abrasive applications.

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"SCOTCHLITE"® Reflective Sheeting • "SAFETY-WALK"® Non-Slip Surfacing

probably each man would rate himself as the best foreman.

When organizing any group of men efficiently for any kind of work one must lead and the others follow. If among the followers there are some men capable of being foremen, they would not very long remain as workers. They have the same right as anybody else to try to get better jobs, but nothing would be gained by their judging the boss. The foreman should be a better man than those working under him.

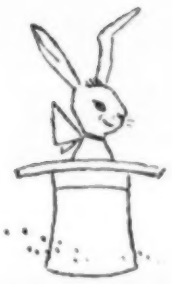
Some of the men would judge the foreman fairly, while the others would take advantage of him, and some would wish he was dead. I once overheard a discussion of that kind during my time as an executive.

If the boss wants to learn something from his men he can talk to each one as he is handing out the jobs. Any foreman's standing among his workers depends also upon the policy he is forced by management to carry out. If management demands a hard discipline which the workers consider as unfair, they would gripe about it in the foreman-rating cards although the foreman had nothing to do with it. He must enforce the orders he gets from his superiors or quit, but this the workers would not know anything about. Their square thinking and serious appraisal would in that case not be worth much.

Ed is right when he refuses to accept the flaws picked by his men. I don't think, therefore, it is fair to compare him with Hitler. Some kind of discipline must be upheld at every place of work, and Ed is not putting himself on a pedestal because of this. It is very true what Ed says—that it's what's in the head that counts.

No, I don't share Al's view that the

"But the lathe runs backwards, Boss!"



MAGICIANS

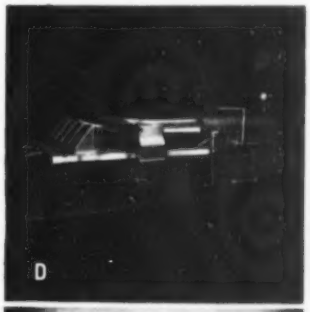
We don't pull rabbits out of hats. Our specialty is designing and building machines that work like "magic" in solving many heavy metal working production problems. The machines shown are typical examples. One of them may be just the answer for your personal production problem. If not, our broad experience in varied fields of the metal working industry enables us to design and build the ideal machine to meet your specific demands.

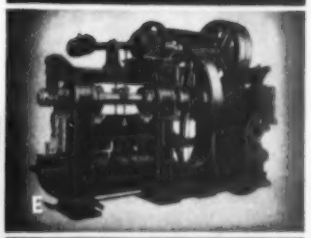
A. BEATTY Guillotine Bar Shear for "short order" shearing of bars, angles, rounds and squares.

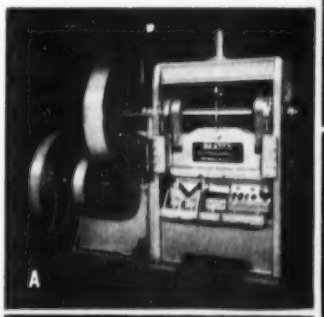
B. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

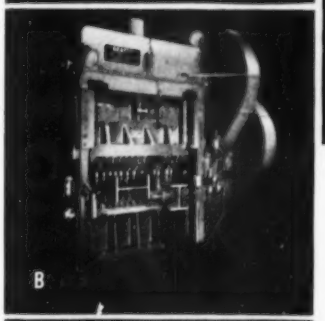
C. BEATTY Spacing Table handles web and flange punching without roll adjustment.

D. BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.









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MACHINE & MFG. CO.
HAMMOND • INDIANA

E. BEATTY CoPunShear, one unit that does coping, punching and shearing without changing tools.

F. BEATTY Gap Type Press for forming, bending, flanging and pressing. Capacity 250 tons.

men should be asked formally to rate their boss. Every foreman has enough worries without such whims. Any man above the average would consider this "squealing" and some of the appraisals would not be honest. The chance for gripes would be taken advantage of.

So please Al, don't value the idea too highly, and don't think you are doing your company any favors by introducing the foreman-rating cards; they would be more harmful than useful.

A E Fristedt
Stockholm-Bromma, Sweden

•

HOW DOES A GOOD athlete, salesman, or foreman become better in his particular field? He improves by checking his assets and liabilities. In doing so he is able to locate potential improvement. By learning the weak points, they may be turned into assets.

A foreman's weak point may be in the way he handles employees. Possibly he is weak in this part of the job because he is always jumping at conclusions. If he locates the weakness, he can reduce tension, instead of going off half-cocked.

Unfortunately many of our leaders—top brass, as well as foremen—have no conception of their liabilities, or for that matter, their assets. They have never made a sincere effort to locate possible sources of improvement. They go along month after month making the same mistakes and blaming others. They make life miserable for others because they do not excel in their particular field.

Every man who leads others should have a self-rating scale. He should endeavor to make it an honest appraisal of personal assets and liabilities. If we look at this scale objectively, stand off and take a good look at ourselves, as we would another

reducing troubles?

Torrington Swaging Machines offer a means of reducing rod, wire and tubing that improves the quality of the material, gives a better surface, without waste of stock. Hammer blows (4000 a minute) speed production, and give the metal toughness and resiliency that cannot be obtained by any other method.

Write for your free copy of "The Torrington Swaging Machine." This informative booklet gives complete details on the art of swaging and the extensive line of Torrington Swagers.

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ZINC with Luster-on IS SUPERIOR TO CADMIUM for most industrial applications

Preconceived notions that cadmium plating just naturally offers better protection than zinc are contrary to the true facts. Simply because cadmium is freer again is no reason for re-converting to it. Cadmium is still and always will be far more costly than zinc. When the zinc is passivated in Luster-on conversion treatment it is far superior to cadmium for all but extremely specific applications. These are basically (1) a marine atmosphere and (2) a bearing surface.

FACT NO. 1

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BUT IF YOU MUST USE CADMIUM to meet specifications, the new LUSTER-ON Cd, specially developed to use on Cadmium plate, will give you a BETTER, BRIGHTER CADMIUM.

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ORTMAN-MILLER SAYS . . .

WARPAGE AND BENDING ELIMINATED

MACHINING SPEED INCREASED 20%

WITH GROUND AND POLISHED

STRESSPROOF®

SEVERELY COLD-WORKED, FURNACE-TREATED STEEL BARS

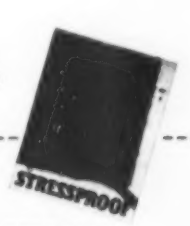
This piston rod, made by Ortman-Miller Machine Co., Hammond, Ind., for their hydraulic cylinders, is machined from Ground and Polished STRESSPROOF.

When this piston rod was made from C1018, Ortman-Miller had trouble with warpage after machining, and with bending and wear in operation. By switching to Ground and Polished STRESSPROOF, warpage was eliminated and machining speed increased 20%. In addition, STRESSPROOF had the strength to prevent bending, and wear became no problem.

STRESSPROOF has improved quality and lowered costs in hundreds of similar applications because of its unique combination of four qualities in-the-bar: (1) *High Strength*, double that of ordinary cold-finished shafting; (2) *Machinability*, fully 50% better than heat-treated alloys of the same strength; (3) *Wearability*, without case hardening; and (4) *Minimum Warpage*. STRESSPROOF is available in cold-drawn or ground and polished finish.

STRESSPROOF makes a better part at lower cost.

SEND FOR . . .
Free Engineering Bulletin
"New Economies in the Use of Steel Bars"



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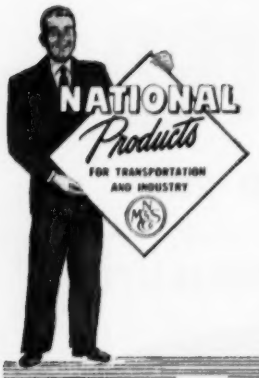
selected for Quality and Dependability

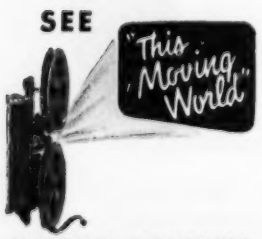


Products bearing these familiar trademarks have all established enviable reputations for quality and dependability. And to guard product reputations, these manufacturers *continue* to specify castings by National —one of the Nation's largest founders.

National's unparalleled experience in producing malleable, heat-treated malleable, and steel castings is at your disposal. Sales offices and engineering facilities are located at all five strategically located plants.

A-5868

PLANTS LOCATED IN Sharon, Pa., Cleveland 6, Ohio, Indianapolis 6, Ind., Melrose Park, Ill., and Chicago 50, Ill.



A 16mm technicolor film. Narrated by Edwin C. Hill, this 27-minute film tells how malleable iron is made . . . tested . . . used . . . how its production economy, ductility, machinability, toughness will give you a better finished product. Available for group showings.

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NATIONAL MALLEABLE and STEEL CASTINGS COMPANY
CLEVELAND 6, OHIO Est. 1868

employee, we will get an honest appraisal.

If we find it difficult to rate ourselves objectively, we can get someone else to do it. We should be careful, however, to choose someone who will be able to make an impersonal estimate. There is no better way to discover weak points and faults. When we know these, we are in a better position to improve them and go on to better things.

A E Salmons
Philadelphia, Pa

•

BEFORE THE DISCUSSION gets complex, shouldn't the first question of the day be "Who is a boss and who does he, in turn, report to?" With a clear understanding of who the boss is, perhaps then we can see who should rate him.

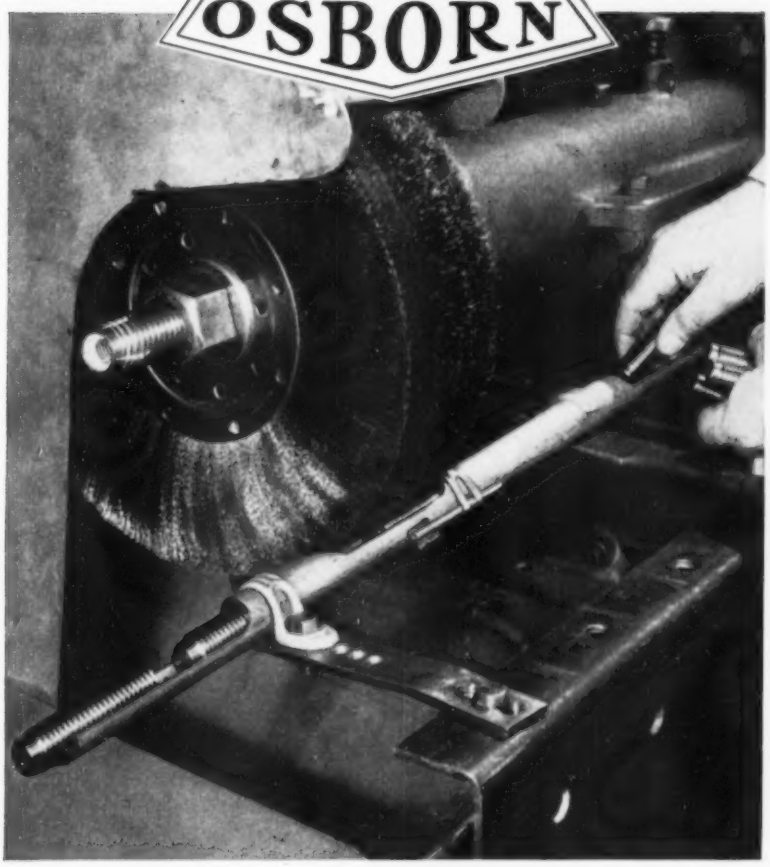
The dictionary states that the boss is a master workman. Therefore, it indicates that first he has knowledge which others do not possess in the same amount or value. It indicates that the boss could start as low as a leadman or anyone who has mastered the art sufficiently to be considered capable of directing others in operations.

How high does the boss go in management? A story which always bears repeating is that told by the president of a large corporation. While he was considered as the "top" by many, he also had a boss. This boss was the board of directors, and the board of directors in turn had a boss in the person of the stockholders. And so it went on.

How can we decide who should rate the boss? Again, let us look at the definition—a master workman. Would it be logical for other workers who had never attained the status of master workmen to pass judgment on one who had attained the level of boss? Would we desire to see judg-

"I'll have to give him credit. That's the closest thing to a hot-rod machine I've ever seen."

OSBORN



How to find an 800% production increase in a piece of pipe

You can save manpower and money in countless ways when you tap the idea resources of power brushing. For example:

It took 18 seconds to clean the threads of the 2½ x ¾-inch set screws shown above. Time was cut to 2 seconds with Osborn Power Brushing by devising the simple pipe fixture shown. The operator feeds the screws in one end of the pipe and an Osborn brush makes contact with the work at a slot cut in the pipe, spinning and cleaning the threads uniformly. A little stationary wire brush, inserted as shown through the pipe, controls rotation and traverse of the work.

Have your **O**sborn **B**rushing **A**nalyst help you develop and apply output-increasing ideas to *your* cleaning and finishing operations. Call now or write *The Osborn Manufacturing Company, Dept. C-1, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

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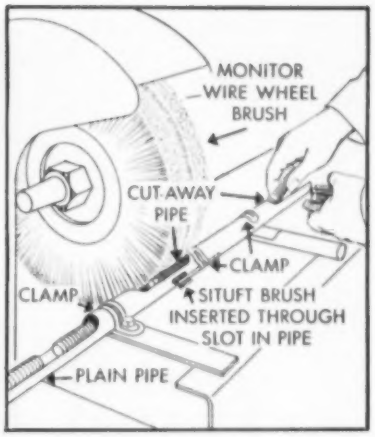
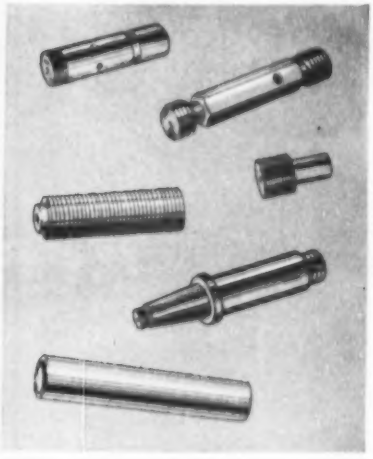
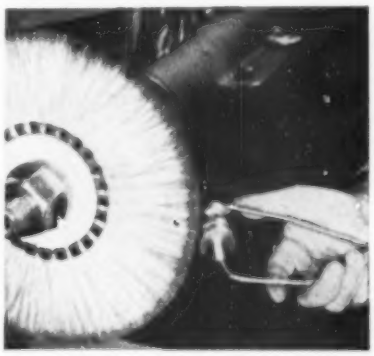


THE FIXTURE. This sketch shows how to make pipe fixture for deburring and polishing small parts, threaded or smooth. Can be made of steel, fiber or plastic tubing.



TYPICAL PARTS. Set screws, pins, pieces of tubing and other parts such as these can be cleaned and finished in the pipe fixture or in the forceps shown below.



ANOTHER SIMPLE APPROACH. For small parts such as bushings, a simple forcep fixture can be devised to hold parts for power brushing. This one is made of wire.

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TOGGLE PADS

Simplify Clamping On Uneven Surfaces

Wherever clamping is done, the Vlier Toggle Pads are practical necessities. These tools will operate with almost any type of clamp or jack, and insure accurate holding because of self-aligning and leveling feature.

Each pad has a 20° (included) angle movement for permitting adaption to uneven or off-angle surfaces. A special "jamming" feature prevents loosening during work, yet allows easy removal from clamp or jack.

All Toggle Pads are made of the finest cold-finished steel, accurately machined for trouble-free performance. Smoothly rounded—gives instant alignment with no "dead" spots. Polished base provides secure seating on any surface at any angle.

Vlier Toggle Pads are available in five sizes. Precision manufacture provides trouble-free service. Like all Vlier products, these units are economically priced, fully guaranteed. There is a local Vlier distributor to serve you.

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Manufacturers of

Torque Thumb Screws, Spring Plungers, Spring Stops, Fixture Keys.

ment passed in our courts by those who never had heard the case and were influenced by having been associated with the man under judgment?

The rating of any individual must be done in a careful and thoughtful manner. Snap judgment or influenced conditions can not enter into the picture. A boss can and probably must be rated, but never by the men that work for or under him. If he is a good boss and is doing his job right, he will never have to worry about what his men think of him.

He must do two things, however. First, he must be satisfied that he is doing his job to the very best of his ability and that he can look all and sundry in the eye and feel secure in saying that he is doing the very best possible job he knows how. Secondly, he must satisfy his boss. In doing this he must fulfill the requirements expected to him.

It is the boss's boss who should rate the boss. He knows the boss's job. He can judge whether the man is doing the work correctly; whether he is accomplishing the job which has been given to him to do; how well he gets people to work for him; how industrious he is and whether he can accept responsibility. In other words, the only person who can rate an individual is one who has had experience on the work and is a higher supervisor.

It would indeed be dangerous if it were considered seriously to have workers rate or judge their respective bosses.

Charles D Townsend
West Hartford, Conn

•

CROSS-CHECK

Is a foreman ever justified in pitting workers against each other as far as producing a specific job goes? Will the men react favorably, or tend to band together and defeat the purpose?

THE USE OF a method by which a foreman pits one individual against another is an extremely dangerous practice. Oh yes, it can be argued for time on end that it has worked in many instances and has, perhaps, increased the output of the individuals. However, in these cases has anyone stopped to consider two things? First, that perhaps neither time element is "standard" and second, that the rivalry that is built up can suddenly reverse itself and slow down the output.

On the second phase of this case, it has been found that the practice

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GEARS

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Philadelphia Spiral-Bevel Gears provide a smooth, quiet and dependable means of right angle power transmission. They are precision made on the most modern gear cutting machines and finished to your exacting specifications. Sizes up to 48 inch diameter. Straight and Curved Tooth, Zerol and Hypoid Spiral Bevels can be supplied. Order Philadelphia Spiral-Bevel Gears.

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...the SPOTLIGHT is on the PRESS-RITE

60 TON POWER PRESS

featuring...

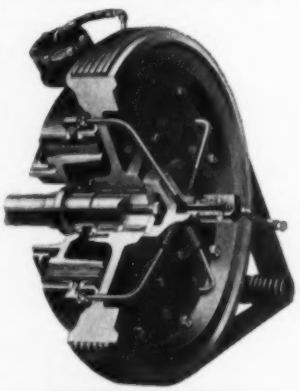
- Press-Rite Airflex Clutch and Brake System
- One-Piece Heavy Duty Frame with Built-In Tie Rods
- Triple Ramway Lubrication
- Non-Repeat Single Stroke Mechanism
- Roller Bearing Flywheel

NOW . . . a 60-TON POWER PRESS

. . . with all the PRESS-RITE Features!

Available in either flywheel or back-geared models, the Press-Rite No. 60 has an extra heavy uni-cast frame with built-in tie rods to practically eliminate deflection on heavy drawing and blanking operations. The Press-Rite Airflex Clutch and Brake System* delivers full stroke power through every operating cycle . . . provides positive, instantaneous braking action. Non-Repeat Single Stroke Mechanism provides absolute safety on single stroke operation . . . is easily changed for continuous operation when desired. Extra large die face simplifies handling of bulky dies . . . cuts set-up time. High production . . . low maintenance . . . long, dependable operation—these proven advantages make the Press-Rite No. 60 a profitable addition to your production line.

* Optional at extra cost on models 20-ton and larger.



PRESS-RITE AIRFLEX CLUTCH-BRAKE ARRANGEMENT

THIS DATA-PACKED BULLETIN . . .

gives you full information on the Press-Rite line of 8 models . . . capacities 5 to 85 tons. If you are planning purchase of power press equipment, either now or at a later date, it will pay you well to study this bulletin first.

Write for Your Copy . . . TODAY!

PROMPT DELIVERY ON MOST MODELS

Sales Service Machine Tool Co. SSMT

PRESS RITE PRESSES • SHAPE RITE SHAPERS • KELLER POWER HACK SAWS

2347 UNIVERSITY · ST. PAUL 4, MINNESOTA

of trying to increase production by causing rivalry among workers, without extra compensation, has usually ended up in an armed truce where all employees band together and themselves decide just how long it will take to do the job. Now the foreman has lost control of his shop, and he suddenly begins to cry to his superiors that the help is no good and that they won't produce.

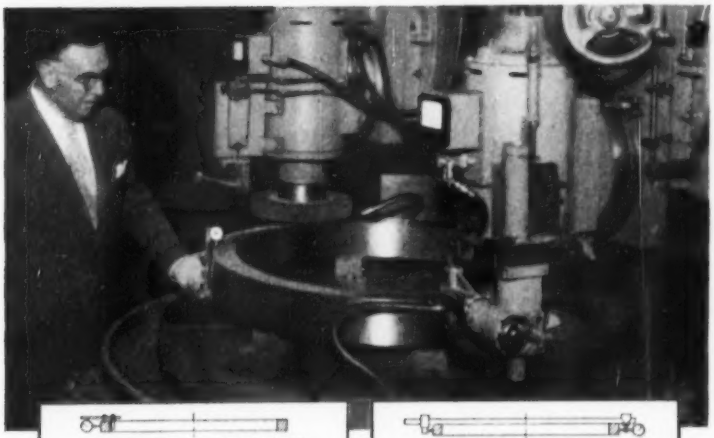
Remember, always, that any idea can be worked once—maybe several times, without drastic results—but as in all things, if any action is carried too far and to extremes, something acting as a counteragent appears to apply the brakes.

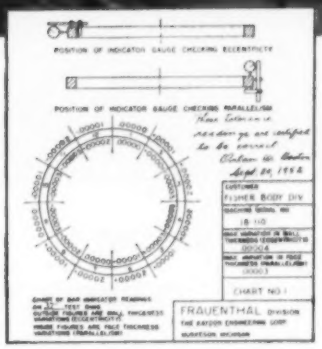
Eventually, the second or third try at this plan of cross-check results in the foreman not actually knowing what can or cannot be done by an average employee working at an average rate of speed turning out quality products. He never has established in his own mind just how long the job should take. Perhaps he is not capable of doing this. This is not something to condemn the foreman for; rather, management should be criticized for not seeing that the foreman has been properly trained to do the work. Let us all remember that if a child were allowed to grow up with no training and no learning, he would be as the natives of the jungle, knowing only what he himself had to learn through his own self preservation. Each and every one of us must be properly trained in the work we have to accomplish.

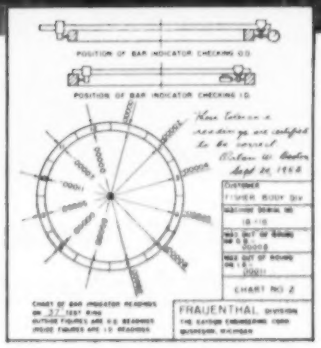
Foremanship is not easy and not every person is qualified to be a foreman. Nor can a person become a foreman without outside help from top management. This problem of dealing with productivity is only one of the many problems that a foreman must face and properly handle each day on the job.

"This coolant now has chlorophyll for those stinking hard jobs!"

GRINDING TO millionths* OF AN INCH




POSITION OF INDICATOR GAUGE CHECKING ECCENTRICITY
POSITION OF INDICATOR GAUGE CHECKING PARALLELISM
FRAUENTHAL DIVISION



* *Our normal method of expressing tolerances in tenths-of-thousandths of an inch became inadequate when precision was attained to fractions of tenths-of-thousandths, expressed best in MILLIONTHS of an inch.*

Utmost precision proved by meticulous tests, and certified by Orlan W. Boston, Chairman, Department of Production Engineering, University of Michigan. He witnessed tests at Frauenthal plant in Muskegon and certified their validity on precision grinding of a 37-inch test ring, on Frauenthal Grinder No. 18-110 (shipped to Fisher Body Division for grinding tank bearings).

You get TOP PRECISION with Frauenthal Grinders

The certified readings listed at left are much closer than the 200-millionths of an inch precision specified for these machines. You can get similar results on other sizes of Frauenthal Multiple-Head Super-Precision Cylindrical Grinders, up to 140-inch diameter grinding on the Series 2200 machines. Uniformity of precision is assured in concentricity, parallelism and roundness. You can make many combination settings of grinding-spindle positions for a wide variety of simultaneous grindings of outside, inside and faces. Details on request.

PRECISION GAUGE READINGS • CHART NO. 1

MAX. VAR. IN FACE THICKNESS (Parallelism)				MAX. VAR. IN WALL THICKNESS (Eccentricity)			
Station	Reading	Station	Reading	Station	Reading	Station	Reading
1	.000000"	7	.000000"	1	.000000"	7	+.000020"
2	+.000010"	8	+.000020"	2	+.000010"	8	+000010"
3	+.000030"	9	+.000030"	3	+.000020"	9	.000000"
4	+.000030"	10	+.000030"	4	+.000020"	10	−.000010"
5	+.000030"	11	+.000030"	5	+.000010"	11	−.000020"
6	+.000010"	12	+.000020"	6	+000020"	12	−.000010"

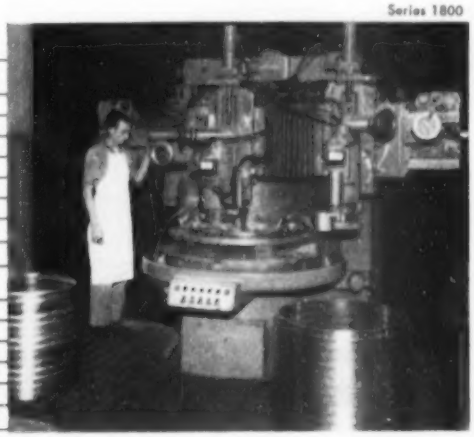
Maximum Variation in Parallelism: .000030" Maximum Variation in Eccentricity: .000040"

PRECISION GAUGE READINGS • CHART NO. 2

MAX. OUT-OF-ROUND ON O. D.				MAX. OUT-OF-ROUND ON I. D.			
Station	Reading	Station	Reading	Station	Reading	Station	Reading
1	.000000"	4	−.000050"	7	.000000"	10	−.000110"
2	−.000020"	5	−.000080"	8	.000000"	11	−.000070"
3	−.000040"	6	.000000"	9	−.000050"	12	.000000"

Maximum Variation, Outside Diam: .000080" Maximum Variation, Inside Diam: .000110"

Series 1800



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made in 10 standard sizes . . . conforming to essential J.I.C. specifications

	Series 1800	Series 2000	Series 2200
Table sizes	30" 36" 42" 48"	60" 72"	110" 120" 130" 140"
Maximum Swing	56" 56" 56" 56"	72" 88"	120" 130" 140" 150"

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Frauenthal Division THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

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LET US SEND YOU MORE FACTS OR BETTER YET SEND US YOUR SPECIFICATIONS FOR PROMPT QUOTATIONS

To consider the present question briefly, suppose that Butler does get a job like the one which Morrison has just finished . . . will there be hard feelings? The only question here is whether Ed is going to cause a situation which will get out of hand. He apparently is not using good judgment in hinting that he wants Butler to do a better job and at a faster rate. If this were not thrown into the picture and Butler was just assigned the job with no comments, then no trouble could arise. A foreman has a perfect right to assign work to any individual under his supervision whom he feels is qualified to do the job. Perhaps others will question the decision, but the placing of the assignment rests with the foreman unless he is using the power, as in this case, to accomplish an end, and has so stated his intentions either by intimation or by actually instructing one person to that effect.

It is dangerous to pit one person against another for any reason. The result may not be what is expected. Better to know your requirements, and how much an average operator can and should do each day than to guess and get into continual labor problems.

Charles D Townsend
West Hartford, Conn

•

THE IDEA of having Butler make up another die has its good points and also its bad ones. While Morrison may have the benefit of his experience in producing the first one, we must not lose sight of the possibility of another worker injecting new and valuable changes which would more than compensate for the other's ex-

"You asked me to get at the source of our trouble in Division 29 . . ."

✓ check the price
✓ check the analysis
✓ check the performance

and you'll specify

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aluminum bronze

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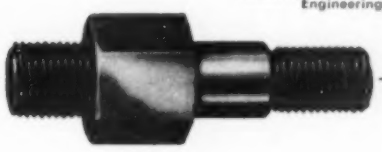

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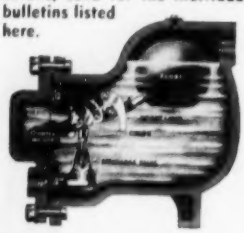

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perience. Whether any hard feelings would result in such an assignment is dependent upon the tactfulness of the foreman and the mental make-up of the workers involved. You'll always find men who are fearful of others showing them up; this will always obtain so long as the competitive world rotates on its reliable Timkins.

Fortunately, workers on the whole are pretty fair-minded and loyal to one another. They will resent any effort on a foreman's part to pit one against another. It may not be that Butler would set out deliberately to cut down the working time on the new die, but there is the possibility that he may turn out the job quicker because of his superiority in skill. No man is so good that another can't go him one better. Could be that Butler is more adaptable to that particular type of work and a reduction of time would be the consequence.

There would be a burning question in Morrison's mind as to why he wasn't asked to turn out a duplicate die because of the rightful reasoning that the second attempt would naturally result in a die produced at less cost. One might say that if he were made of the right stuff he would assume that the foreman knew what he was about. "It's his job to supervise, so why worry about it?" However, I do think that a little humane consideration should be shown Morrison so as not to have him left holding the mental sack and wondering what's going on. I wouldn't ignore the man entirely; I'd make some comment as to why the other man was getting to do the job. Unless it can be definitely proven that Morrison had stalled on the job, the foreman is laying himself wide open to a charge of unfair tactics if he lets it be known that

"OD, ID, PDQ!"

If You are Responsible for Tooling and Production, Accept this Challenge and Get Results!

If other men with responsibilities like yours can find a new source for cost economies in their tools and dies, why can't you? By taking a fresh look at this vital cost zone, one plant now makes far fewer dies each year to do the same jobs. Another has been able to lengthen die life between grinds so that costly machine downtime is no longer a problem. Still another reports that expensive die finishing and adjusting are being held to a minimum.

Another good example is the job shown above. These tools notch different shapes in materials ranging from $\frac{1}{8}$" thick c.r. steel to $\frac{1}{4}$" diamond plate. A re-check of the dies showed that a steel with more toughness was needed, and Carpenter R.D.S. (Oil-Tough) was put to work. Now, where the "old" tools chipped badly and required frequent regrinding of as much as .031" off the surface, the R.D.S. tools hold up day after day with only occasional sharpening. And when sharpening is required, the toolroom has to remove only .010"/.015".

To re-check *your* cost relief zone, use The Carpenter Matched Set Method to select the one steel best suited to cut costs. This method is backed by strictly dependable tool and die steels that *stay* on the job. For rush delivery, call your nearest Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL COMPANY, 109 W. BERN ST., READING, PA.

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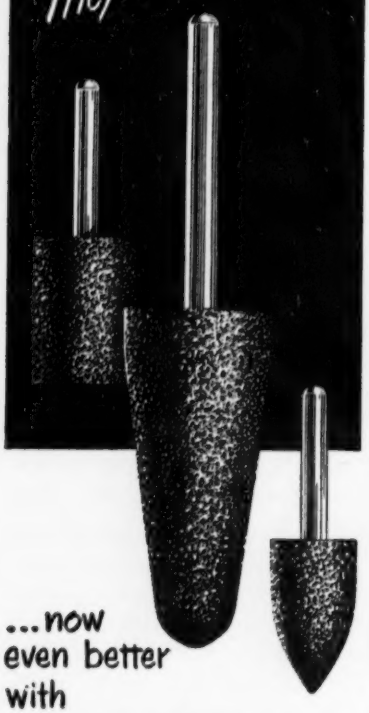

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he is giving the work to another man because he feels that the first one deliberately took his time on the assignment.

If the die was given to Butler without any comment, then Morrison would naturally wonder what was wrong. Many questions would arise in his mind as to why someone else was given the work to do. Morrison may rightfully ask himself: "Could I have done an unsatisfactory job? Did I take too much time on the thing?" The poor guy may have been very conscientious and done his best. As often happens, he may have had periods of hard luck which usually beset the best of men; the chances are that if he were given the opportunity to make another die he would have clear sailing which would reduce the working hours to a marked degree.

So much for the producer of the first die; now for the position of the other fellow. Wouldn't Butler feel like a heel if he were given the job to do knowing that the boss felt that the other man took too long on it? Let us consider Butler as being the average guy who strives to help his fellow worker along. Would he not rebel at the thought that the foreman was pitting him against the other?

So far, no consideration has been shown the foreman on whose shoulders this problem rests. He has a job to do and I'm pretty sure that he will make no mistake if he takes the two men into his confidence and lets them know that he wants to shoot square.

J. Homewood
Ontario, Calif

•

I THINK ANY foreman who plays one man against another has something lacking in his approach to what seems a fairly simple problem. If Ed really believes Morrison took too much time in doing the job in question, the thing to do is to put it squarely up to Morrison. If Ed has figured to back up his contention, which he certainly should have, there is no doubt in my mind that Morrison will ask for another crack at the job and probably better the original estimate. But if there is any cross-checking to be done, I suggest it should be done by Ed sitting down in front of the blueprint and going over step by step the operations necessary to complete the job. Even the best estimators sometimes slip up in their calculations, and maybe this is a case in point.

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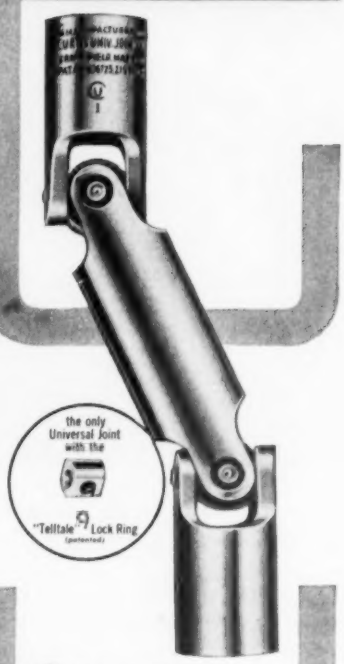

(1) 14 sizes — 3/8" to 4" O.D. in stock at all times for immediate shipment; bored or unbored hubs.

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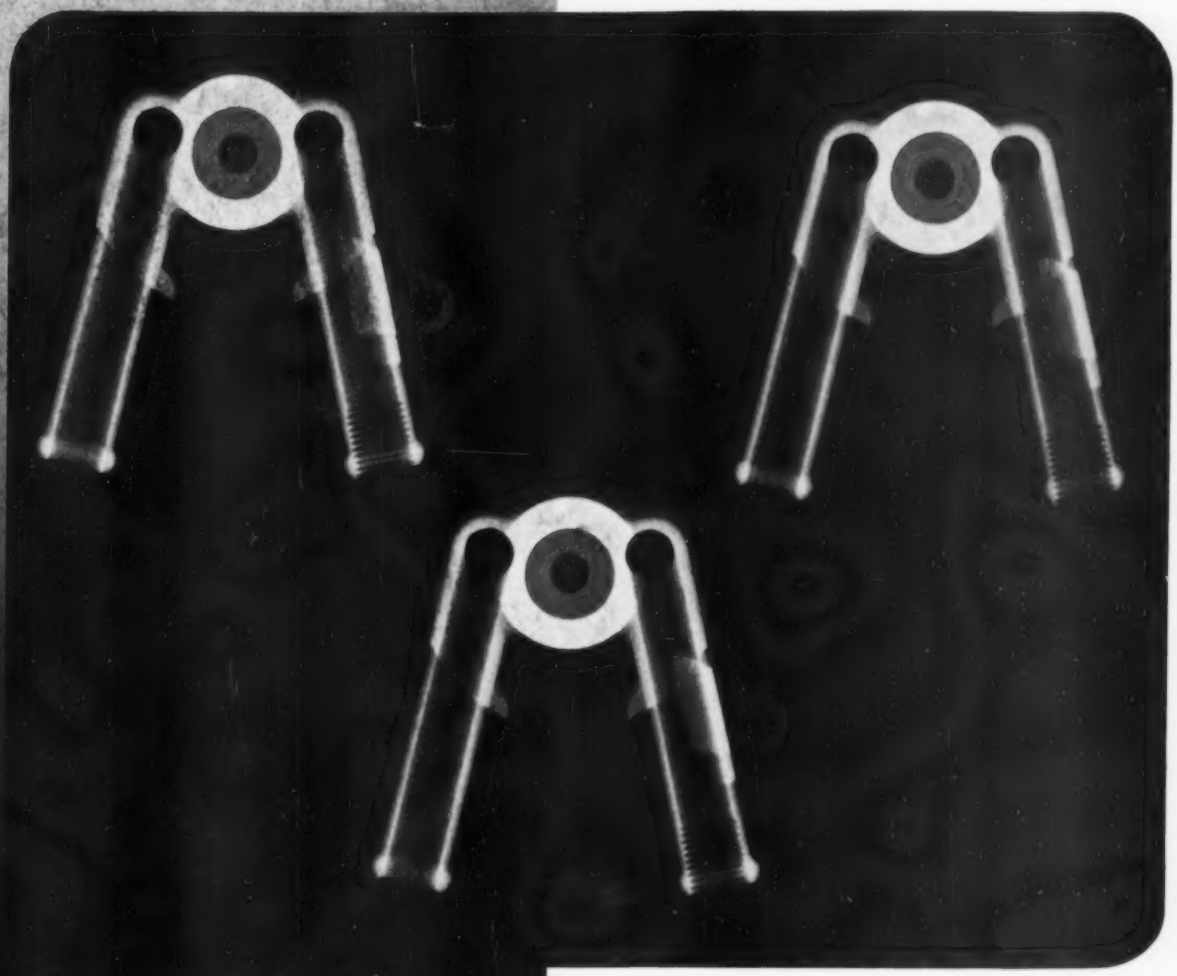

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Cases like this show why more and more progressive suppliers of castings are employing radiography. It leads to sound production quickly, lets them know only high-quality work is released.

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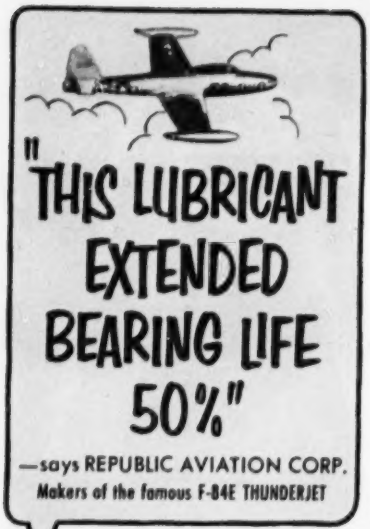

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REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

In any event, hinting is a poor method of conveying one's ideas or opinions, and should have no place in a foreman's dealings with his men, at least if he wishes to retain their respect. The average man likes to do good work in a reasonable time and will respond to criticism or suggestion if approached in the proper manner.

I can remember during my apprenticeship at the trade, two foremen who made a distinct impression on me. One, whom the men called "Old Fuss and Fury," had the unfortunate habit of flying into a rage if he saw or thought he saw a man doing something not according to Hoyle. Instead of trying to make a man see reason by behaving reasonably himself, he would barrage the unfortunate victim with sarcastic remarks and leave him so rattled that he was no good for the rest of the day. The other foreman was of an entirely different stamp. I can remember him one day watching me set up a job on a planer. It wasn't going so well and we both knew it. Finally, as I stopped to wipe my brow and get my bearings a little, he came over and said to me with a smile, "You're making heavy weather of that, son. I think we can work out a better method than that." And in a very short time we had, and my respect for this gentleman has grown with the years.

As I say, these two men formed a distinct impression on my mind. I don't think Morrison is going to form much of an opinion regarding Ed's abilities as a foreman if Ed goes to Butler as planned with his idea of having Butler beat Morrison's time. In Butler's shoes, I would be inclined to resent being put on the spot and be apt to string along with Morrison to the extent of turning in an almost identical time on the job. Which would leave Ed about where he started.

Let us suppose that Ed has another thought and decides to try the straightforward approach. He should study his figures carefully, and being still of the opinion that Morrison's time shows room for improvement, his next step would be to have a get-together with Morrison and go over each step of the job to locate if possible the operation that might be consuming too much time. In order to get anywhere, however, a mood of mutual cooperation must be established. Once that mood is established a great deal can be accomplished between man and man. What Ed proposed to do with his so-called cross-check would have established a mood of distrust and suspicion and gone a long way toward destroying shop morale.

Robert S Alexander
Greenville, RI

•

YES, ED has a perfect right to tell Butler to make the new combination die. But the whole case looks to me as double-crossing instead of cross-checking.

As Ed doesn't intend to give Morrison the job on the grounds that he took too many hours making the same kind of die a short time ago, I should like to know what instruc-

COUNT THAT DAY LOST WHOSE LOW DESCENDING SUN DOES NOT SEE ONE INCOME TAX BLANK TORN UP AND ANOTHER BLANK BEGUN!
WHAT HE WANTS TO DO IS FENAGLE THE TAX A LITTLE AN' KEEP OUT OF JAIL AT THE SAME TIME!
WITH HIM FIGURES ARE SOMETHING WHAT THE PIN-UP GIRLS HAVE!
HE SAYS THE DOCTOR PRESCRIBS HIS LIQUOR AN' HE'S GOING TO DEDUCT THE 'SHOTS' AS MEDICAL EXPENSE!
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LOU MORTISON

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...wait—and watch production stay at zero

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...and pay your employee while he goes for the belt

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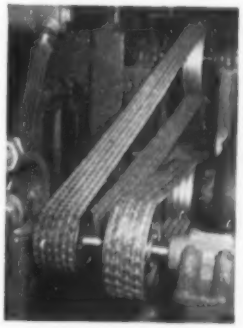

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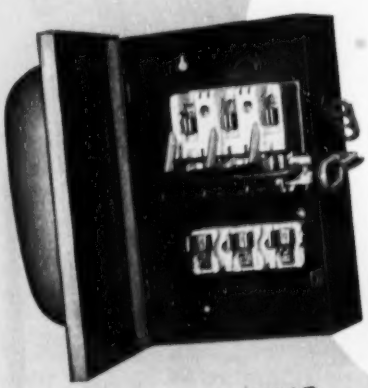

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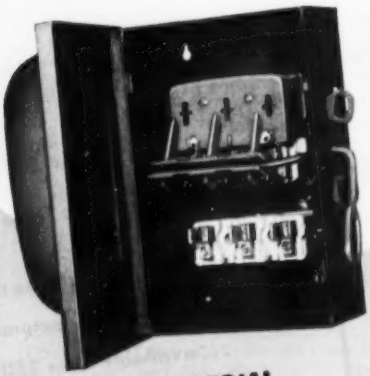
90,000 line designed for residential, commercial and other applications where price is limiting and the service factor is not great.



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80,000 and 50,000 line designed for mass production industries where price is secondary to continued performance under conditions of severe service and maximum safety. The 50,000 line is used where space is limited. BOTH ARE TYPE A but go far beyond those requirements.

UNIFORM STYLING

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

tions he gave him when he made it, and what size material was available.

I'm not so sure that Morrison is to blame. Perhaps Ed is incompetent to judge what time it should take to make a die of the type in question. If Ed is an expert diemaker, then, of course, his opinion on this particular job must be accepted. But if he is not a tradesman and got his job because he is a relative of some top brass, I wouldn't pay much attention to his conclusions.

Before this last expansion in the mechanical trades, many foremen griped about the time taken for every job, thus thinking they would get more out of each man, but today this is a very dangerous method if they want to keep the working force at full strength.

I think Ed should have urged Morrison in a friendly way to try to get the die finished faster than he did. And I wonder if Ed is sure that Butler can make it in less time than did Morrison. Perhaps Butler needs the same number of hours or more to make the die.

If Ed knows for sure that Morrison is a slow guy, then nobody will blame him for trying out another man to meet schedule; otherwise he is doing a great deal of harm. It is quite possible that Morrison will speed up his work on the second die because he knows better how to go about the job.

By telling Morrison it would be tiresome to make another die, Ed is proving himself to be a poor psychological judge. How does he know that Morrison will take that statement the same way as the foreman? If a bug should be put in somebody's ear, it should have been done on Morrison when Ed thought he was using too much time on the first die.

Oh yes, a foreman should hint sometimes; he gains by doing so, but he should do it in such a way that

"I could swear there is no handle in the die."

IF THIS IS YOUR PROBLEM

TRACER TURNING TOUGH ON TOOLS?

These tools will solve it!

Tracer turning has this great advantage —higher production rates can be attained, using far less skilled operators' time than is required for the conventional "cut and try" procedure.

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Kennametal pioneered this field—has developed carbide tooling for light and heavy tracer lathe jobs, including roll profiling. With this tooling, tracer turning has reduced machining time as much as 80%*.

Our engineers will cooperate with you —give you the benefit of their industry-wide experience—develop the most suitable Kennametal tooling for your tracer operation. Write, telling us your problem. Kennametal Inc., Latrobe, Pa.

*Performance studies will be sent upon request.

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THAT INCREASES PRODUCTIVITY

This Standard WENDT-SONIS tool saved 35% on one application!

THE PROBLEM

Finishing a 19" motor rocket body chucked with a rubber expansion arbor. The rubber expansion arbor made use of a coolant impossible. A high speed steel tool was tried but proved ineffective because no coolant could be used. Resulting high cutting temperature dulled the high speed steel almost immediately. Special carbide tools were being tried, but costs were high and delivery slow.

Harold Shelley
Ann Arbor, Mich.

THE SOLUTION

Harold Shelley of Gransden-Hall Co., Wendt-Sonis distributor in Ann Arbor, Mich., solved the problem. He recommended standard Wendt-Sonis BR-86 carbide tipped tool bits modified from a 15° to a 25° cutting angle. These Wendt-Sonis tools, taken from the distributor's stock, cut production costs and effected an overall saving of 35 per cent on the entire job.

WENDT-SONIS WILL SAVE YOU MONEY

Be sure you have the RIGHT tool for the job! You'll find that only Wendt-Sonis offers a complete line of dependable, precision carbide tools for every cutting application. All Wendt-Sonis Carbide-Tipped Tools have rust-resistant tool shanks made from highest quality steels for greater economy and faster production.

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"THE MOST COMPLETE LINE OF CARBIDE CUTTING TOOLS"

the man he is talking to accepts his argument without getting angry. I think Ed is wrong when he expects Butler to buckle in and get the second die out in record time if he tells him Morrison used too many hours on the first one.

A foreman should never slander any of his men by telling someone in his crew something bad about anybody else. If a foreman does that, there won't only be a bad feeling between the two of his men, but also between the blamed one and the foreman, and perhaps also between the told man and the foreman. Why doesn't Ed understand that his men are talking things over when anything unusual happens?

Butler might well get the advantage of Morrison's experience, which, of course, is not fair under the circumstances. If, on the other hand, Morrison was needed on another important job, his experience might be of benefit to all concerned. A foreman should always be able to judge proper production without setting up competition.

A E Fristedt
Stockholm-Bromma, Sweden

•

THERE SHOULD be no necessity for a foreman to check one man's time against another's in order to find out how long it takes to manufacture anything. The estimated time must be somewhere in the organization, and he ought to root it out and make use of it.

If the shop is engaged on contract toolmaking for outside firms, then a firm estimate must have been supplied to the customer before work was started on any piece of equipment. The estimated price must have been reached by some form of estimation, even inspired guesswork.

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but it is fairly certain that some idea was obtained as to how many manhours would go into the work.

When a price has been quoted for a one-off job and the contract obtained, it is obviously more profitable to the contractor to reduce the production time to its lowest possible figure, since every hour that he saves from the estimated time is clear profit. It therefore behooves the astute foreman to get the work done in the least possible time so that the firm's profit will be as high as possible.

If the margin of time allowed on the job is very small, then the foreman should give the work to his best men so that the firm will not show a loss on the job. If he makes the mistake of giving a closely-timed piece of work to one of his slow workers, then he is the victim of his own folly if the man exceeds the allowed time.

It is, therefore, apparent from this that a foreman should know for certain who are his fastest workers and who are the slow and steady plodders. Also, he should have some clear idea of the estimated time allowed to perform a piece of work and the performance should be based on average effort, not outstanding ability.

In a small and closely-knit organization, the giving of the second order for a piece of equipment to a man who has not done it before is not a very bright idea. Even the dullest workman improves with practice, and it would be a very outstanding machinist who could make record production times against one who has had previous experience on the job. It is possible that the first order called for the grinding of a special tool or the arrangement of an intricate set-up. The man who has already done the job will be in possession of both the tool and knowledge of the set-up, and what was used to make it. He

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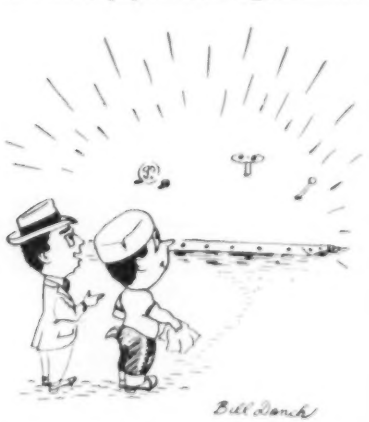
might pass along the tool and the knowledge to the second man, but nine times out of ten, his injured pride would demand that he withhold any help from his usurper.

The true production time required to perform any piece of work is not that obtained from the faster worker. It is, rather, an average time obtained from the observed performance of as many workers as possible.

At the present state of development of engineering organization, the time required to make any mechanical object can be obtained very closely by the compilation of synthetic time elements. There is no necessity for foremen of tool shops to organize speed contests between workers and then try to obtain an average time from them. It has already been done. Catalogues of synthetic times derived from thousands of observations are available for the guidance of those who wish to estimate accurately the time needed for doing a job.

In Britain, we are great believers in worker incentives in the form of bonuses or piecework rates. The incentive bonus is applied to a large number of contract toolmaking firms and also to toolrooms attached to manufacturing organizations. It works very well and appears to be the only practical solution to the problem of raising the productivity of out-plants to the high levels obtained in the USA. We find that firms which work on a straight hourly rate of pay do not turn out the goods as quickly as those with incentive schemes, which give the worker a reward in relation to his output.

It is unfortunate, however, that the planning, estimating and rate-fixing required to operate an efficient bonus system involves the firm in a lot of paper work, together with



"—Great, Mac, but you really don't have to wipe 'em quite that good!"

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The Mattison Machine Works #24 Rotary Surface Grinder illustrated is equipped with a ½ HP Gusher Coolant Pump.

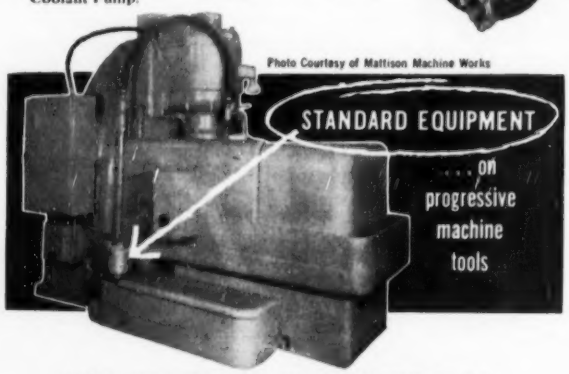

Photo Courtesy of Mattison Machine Works

THE RUTHMAN MACHINERY CO.

1818 Reading Road, Cincinnati, Ohio

increased overheads in the shape of desk workers. The estimating and rate-fixing are dependent upon good planning of the manufacturing methods used; to coordinate these functions, it is necessary that men with considerable practical engineering experience be employed to control them.

Despite this tendency toward a top-heavy organization, the practical workers in the firm are given a lot of valuable detailed information in the shape of estimated times for performing work. Other advantages which follow from the incentive bonus schemes are accurate price estimates when quoting for contracts, machine-loading schedules which bear some relation to reality and guidance for a foreman, who knows, from the time supplied to him, who is the slowest and who is the fastest worker in the section which he controls.

Clifford T Bower
London, England

•

IS A CROSS CHECK fair? If done openly, as part of normal procedure, not only is a cross-check fair, it is in many circumstances highly desirable.

Unfortunately, it is becoming fashionable today in industry to regard the rank and file as possessed of all the virtues, and the responsible executives as something of a liability. Appeasement has a place in life, but so has good discipline and the decision to cross-check or not must be left to the man who will ultimately be held responsible for the final cost of the job.

Employment is essentially a contract between man and employer, and the essence of the contract is a fair day's work for a fair day's wage. If both honor the contract there should be no need for appeasement on either side.

I feel that Ed's first mistake was in not telling Morrison that too much time was being consumed on the combination die. Had he done so, Morrison would probably have advanced some explanation for the delay, which Ed could have examined. If the explanation seemed weak or pointless to Ed, that would be an excellent opportunity for him to get the matter on a proper footing, besides serving notice on Morrison that Ed knew his job.

If Ed was thoroughly satisfied in his own mind that the job was taking too long, it was up to him to show Morrison how time was being lost and how it could be saved.

Don't invite controversy!

Have your gage blocks inspected periodically

$16.50 for an 84-block set.
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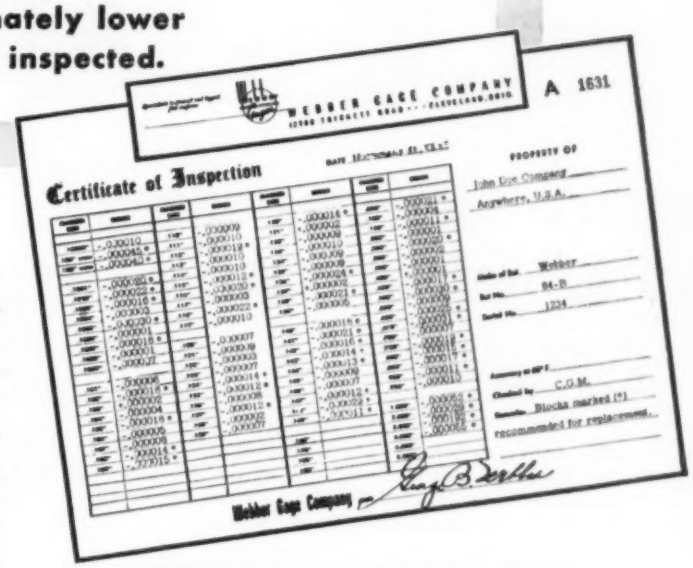
... all makes of blocks inspected.



Don't allow wear in gage blocks to cause unexplained difficulties in assembly. When trouble develops start checking the blocks immediately.

If they have been used daily for any long period of time they should be examined just to make sure their accuracy is still within tolerated limits. Better yet send them to us before trouble occurs. You may find that only a few blocks need replacement.

Instead of discarding an entire set, replace those that need replacement and save money in doing so. The set will be returned within 24 hours after it is received with a certificate of inspection, noting the degree of wear of each block. Webber Gage Company, 12901 Triskett Rd., Cleveland 11, Ohio.

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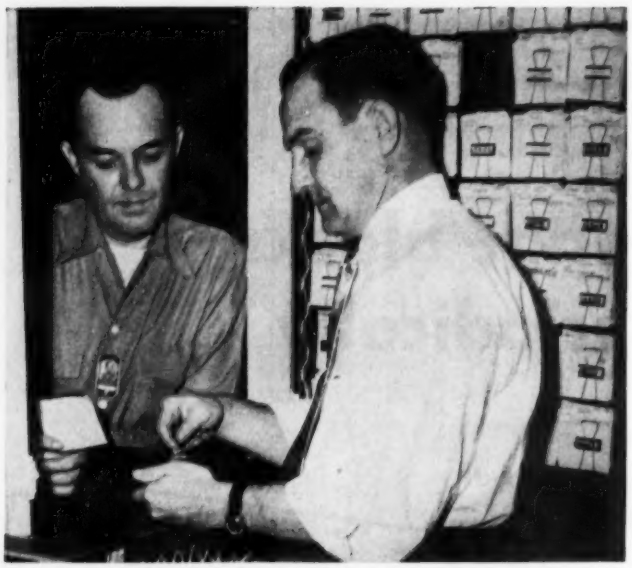

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. . . improved service at the crib windows;

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. . . a 40% saving in procurement of standard tools and consumable supplies in first year's operation;

. . . monthly report of the cost of worn and damaged tools and miscellaneous consumable materials chargeable to each unit that is effective in holding them at a minimum;

. . . usage factor on all tool items that provides basis for reducing crib inventories;

. . . Broken or Lost Tool Report procedure that has reduced misplacement and loss of tools and makes available valuable data on reasons for breakage and for inventory and cost records.

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Merely to hint that the job was going to cost a pretty penny could mean many things, e.g., high material costs; excessive overtime, due perhaps to a snap delivery being demanded from above; faulty machining executed in other sections by people other than Morrison—for all of which Morrison could not be held responsible.

No, Ed should have been more direct. I always favor the direct approach myself and, incidentally, the direct approach need not be offensive. Indeed, if a foreman has made himself master of all the pros and cons in a given case, and is sure of his ground, polite questioning concerning weak planning or execution on the part of an operator can often be very satisfying, even amusing. If the foreman has not taken this elementary precaution, he is asking for trouble by getting involved in a discussion without being adequately prepared. In such an eventuality, a quick-witted operator would probably trot out a number of plausible and seemingly convincing explanations to account for the time on the job, and the hapless foreman, although justified in his suspicions (they can only *be* suspicions if not previously verified) would be compelled to retreat, or at least to temporize.

Shouldn't the foreman be able to judge proper production without setting up a cross-check competition? Without doubt he should, and most foremen of experience can tell when time is being wasted on a job, wilfully or otherwise. The experienced foreman can *sense* too much time on a job and there is no objection to him discussing such a matter with a colleague, preferably of wide experience. If the colleague consulted happens to have intimate knowledge of the particular job on hand, so much the better; collaboration will

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"Taps that Shoot!"
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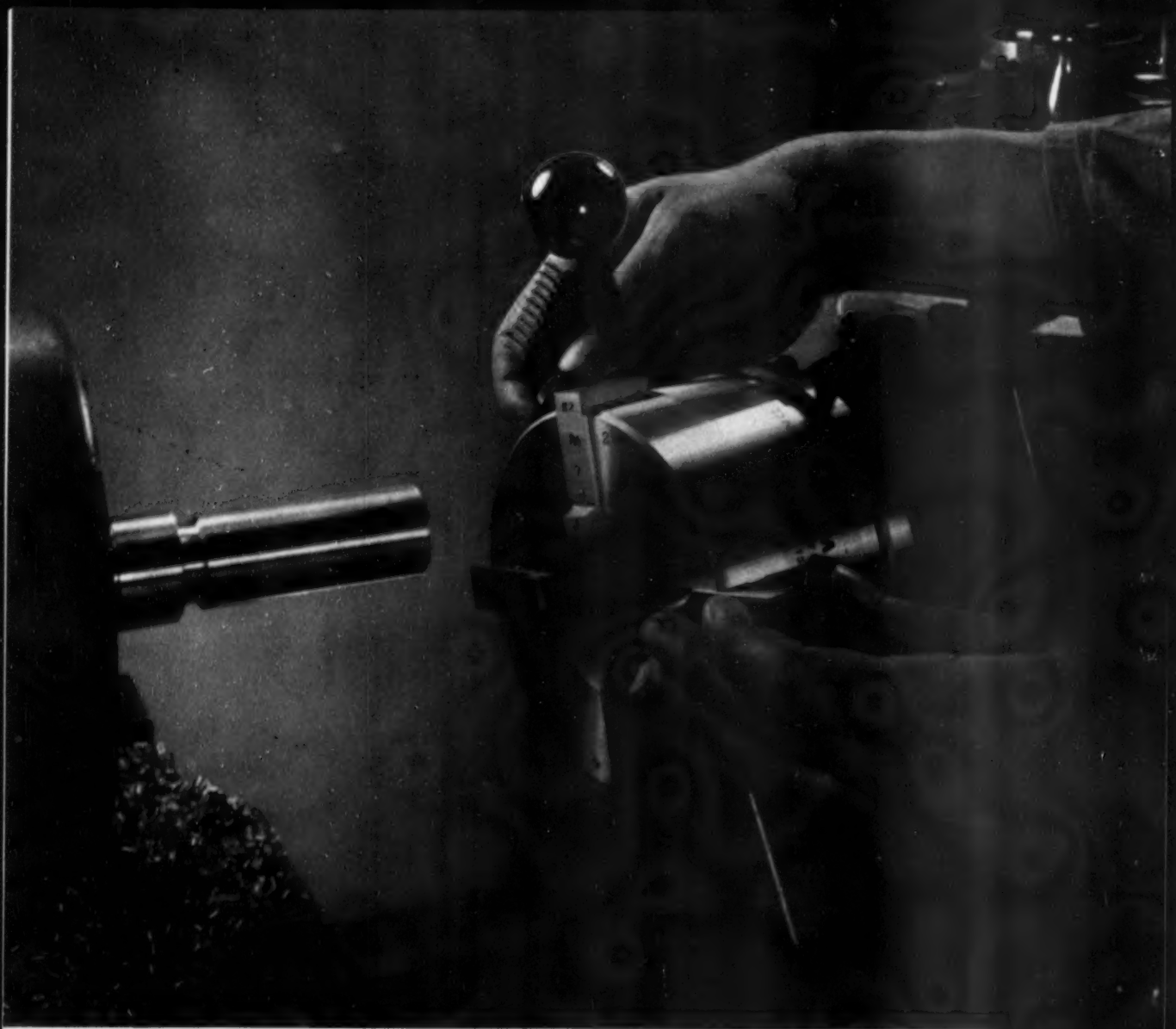

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Quick chaser insertion and removal means less down time on threading jobs, and it's a big feature of GEOMETRIC "D" type Die Heads.

Just pull up a stop plunger and snap the chasers in or out of their slots in less time than it takes to tell how. No face plate to remove, no screws to replace, no parts to adjust.

Simple to operate, rugged, precision built. That's the GEOMETRIC "D", industry's BASIC DIE HEAD, the one to which all others are compared.

Write for full details. Specify Bulletin D

Greenfield Tap and Die Corporation

GEOMETRIC TOOL COMPANY DIVISION

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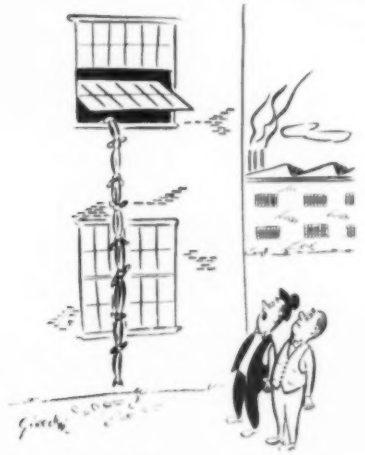
then be fulfilling its highest purpose.

The really important point is that when the foreman smells a rat it is his immediate duty to examine and check on his fears. Paper and pencil and a critical assessment of how long a time should normally be given to each operation will soon confirm or allay those fears. Such a personal check will show if the time taken is excessive, in which case he should take the matter up in the frankest possible manner with the man concerned, but only when he is in a position to demonstrate convincingly the soundness of his contention.

The whole success of the inquiry from the foreman's point of view depends on the thoroughness of this preparation. If, after discussing the matter with the man nothing has emerged to shake the foreman's confidence in his own conclusions, there is no reason why he should not give a repeat execution to another operator as a cross-check, provided he has reason to believe that his alternative choice of operator will be individualistic enough to cut the time on the job. This is the crux of the whole matter.

If the alternative selection works in harmony with the previous operator, the cross-check method simply does not work in the interests of the company. Indeed, it has the opposite effect of spuriously putting the foreman in the wrong by giving the faked impression that the time taken by the previous operator was just about right. The cross-check is a two-edge sword and before a foreman decides on that method he must be absolutely sure of his ground. He must not merely *think* the alternative choice will play the game, he must be as certain of that



"So—now the guys on the second floor are sneakin' out for coffee!"

ARE YOU WASTING DOLLARS TRYING TO SAVE PENNIES ON CUT-OFF JOBS?

Wells No. 8 with wet cutting system.

A Wells Metal Cutting Band Saw pays for itself in savings . . . and you get greater accuracy, greater dependability

IT'S easy to fool yourself when you figure the costs on your cut-off jobs—perhaps you say like so many, "It doesn't amount to much, so why worry about how we do it." You'd be surprised. Just look at what a Wells Saw gives you—Modest first cost with a model for every budget . . . Rugged, heavy duty construction for minimum "cost per year of life" . . . Fast, continuous band saw cutting . . . Accurate cutting to minimize subsequent machining . . . Simple operation requires no special skill and will cut without attention once it is started.

Check your present cut-off methods against these advantages and we think you'll see how you can slash your cut-off costs and start saving those dollars that are being wasted. Ask your Wells Distributor for further information or write direct.

Standard Wells Saws are available in the following capacities: No. 49A —3½" x 6⅝"; No. 5—5" x 10"; No. 8—8" x 16"; No. 12—12" x 16". Wet cutting systems available for Nos. 5, 8 and 12. Automatic bar feed available for Nos. 8 and 12. Special machines for capacities to 48" x 48".

Wells saws

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FOR *Strictly* IMPERSONAL INSPECTION CHOOSE AMES DIAL COMPARATORS

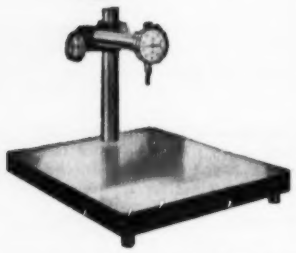
Ames Dial Comparators make the inspection of duplicate parts an extremely simple, rapid and accurate operation. Ames Comparators are strictly impersonal in their accuracy — the results being in no way dependent on the skill or judgment of the operator. The pressure of the gauging members against the work is mechanically determined and therefore uniform.

Check the Ames Dial Comparators shown — one of them may solve a Quality Control problem for you.

Ames No. 1 Dial Comparator is an easily adjustable bench model that measures objects up to 2" in cross section. The table bracket may be quickly located and locked in position on the column. The table itself may be further positioned and locked for final fine adjustment. This comparator is designated *Ames No. 1W* when equipped with dead-weight contact pressure and contact area to ASTM specifications for measuring resilient materials, such as rubber, plastics, etc.

Ames No. 2 Dial Comparator is a compact, stable bench model for measuring non-yielding materials — sheet metal, glass, hard rubber. The 2" diameter table is adjustable to bring pointer to zero. *Ames No. 2W* is similar to the Ames No. 2, but is furnished with dead-weight contact pressure and contact areas to ASTM specifications for checking textiles, plastics, sheet rubber, etc.

Ames No. 13 Dial Comparator features flat-ground, cast-iron base of ample size for using V-blocks and locating fixtures for checking rounds, flats and odd shapes. Also, the No. 13 can be fitted with a fine adjustment for close setting. Accurately adjustable bracket holds any Ames Micrometer Dial Indicator.



Ames No. 130 Dial Comparator is designed especially for inspecting comparatively large parts. For this reason, the flat-ground steel base, the adjustable indicator support on which can be mounted any Ames Micrometer Dial Indicator, and the upright column are proportioned to suit the user's particular requirements.

Send us your Quality Control job specifications, and we will supply complete details and proposal without obligation.

Representatives in principal cities B. C. AMES CO. *26 Ames Street Waltham 54, Mass.*

Mfgr. of Micrometer Dial Gauges • Micrometer Dial Indicators

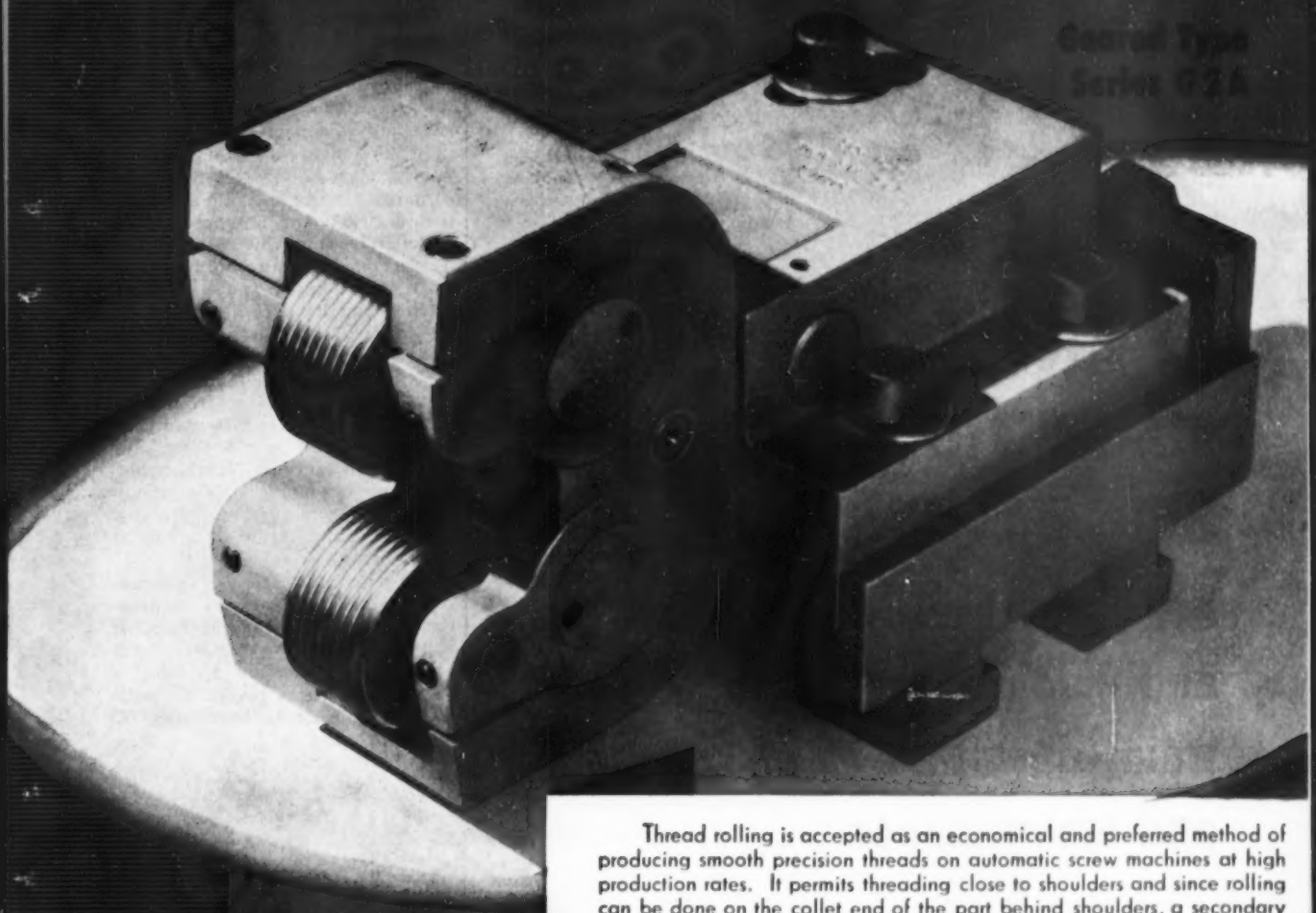
fact as it is humanly possible to be.

Much the better idea is to plant it on the man who did the first job and who, as Al suggests, could naturally be expected to save time on a repeat. By politely but firmly proving to the man that his time is too high on the first job, the foreman might casually appeal to his vanity by suggesting that such a time is wholly inconsistent with his known record and his generally recognized skill as a toolmaker. A quiet reminder might follow, that reduced time on a repeat job is an automatic expectation, and that that saving plus a saving due to his peculiar skill on such work would be more in line with what all concerned expected from him. Even now, in this all-men-are-equal-ridden world, we mostly all in our secret hearts, believe that we are just that little bit better than the other fellow, and recognition from the boss—real or implied—of that superiority flatters our vanity and calls forth that extra effort.

To be a good talent-spotter is to be a good foreman. Years ago I took over the tool side of a manufacturing concern of worldwide ramification. The directors were anxious to have introduced into the toolworks a system of payment by results. I was given a free hand in the matter and decided on straight piecework. Fortunately, I enjoyed the double advantage of previous piecework experience and of being a complete stranger to all concerned. After a month or so I realized I was faced with a formidable task, as 90% of the shop personnel appeared to be rabidly opposed to payment by results and speeding up in any shape or form. The first few months were spent sizing up the position and getting to know the men intimately, at the end of which time I resolved to start piecework with

"He's going to feel like a fool when he finds out what kind of forger Clarence really is."

Thread Rolling Attachment

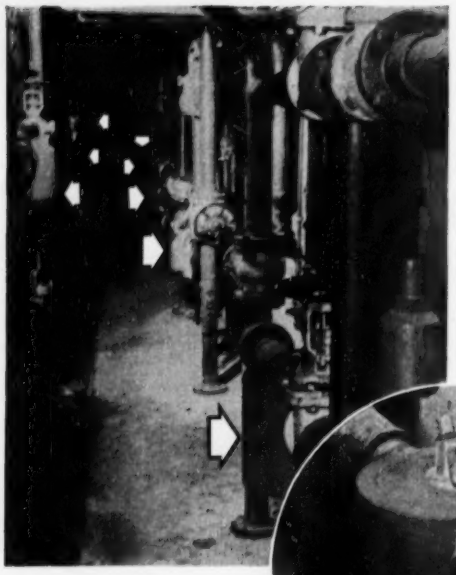


Thread rolling is accepted as an economical and preferred method of producing smooth precision threads on automatic screw machines at high production rates. It permits threading close to shoulders and since rolling can be done on the collet end of the part behind shoulders, a secondary threading operation is often eliminated.

The Reed Thread Rolling attachment is a multi-purpose tool with two opposed rolls which pass over the work when rolling the threads. It is built in several sizes and each size has a diameter from zero to maximum capacity. The Reed Attachment is easy to set up. Simple precision matching unit provides for accurate matching of the thread rolls. No change in spindle speeds is necessary and only a few revolutions of the work are required to roll the thread.

Write for Thread Rolling Attachment Bulletin 1-20

REED ROLLED THREAD DIE CO., Worcester, Mass., U. S. A.



Frantz FerroFilters in lubricating system of 4-high, 5-stand cold mill in one of the country's largest steel mills.

Get rid of iron and steel particles in lubricating oil, hydraulic oil and coolants.

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help beat tool and machine wear, downtime and maintenance

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Performance records prove the effectiveness of Frantz FerroFilters in removing abrasive ferrous particles from circulating oil and coolant lines. Here's what customers tell us! "Maintenance cut 90%" in gun drilling operations; "Cleaner threads, longer tap life," reports another; in grinding, "We get better finishes." And there are hundreds more who have solved production and maintenance headaches with Frantz FerroFilters.

Units available on rental plan. Write us for details.

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one man who, I felt sure, knew his own mind and who, if fairly treated, would see the thing through. He did not disappoint him; his earnings varied from 50 to 100% above time rate. I then sat back and waited.

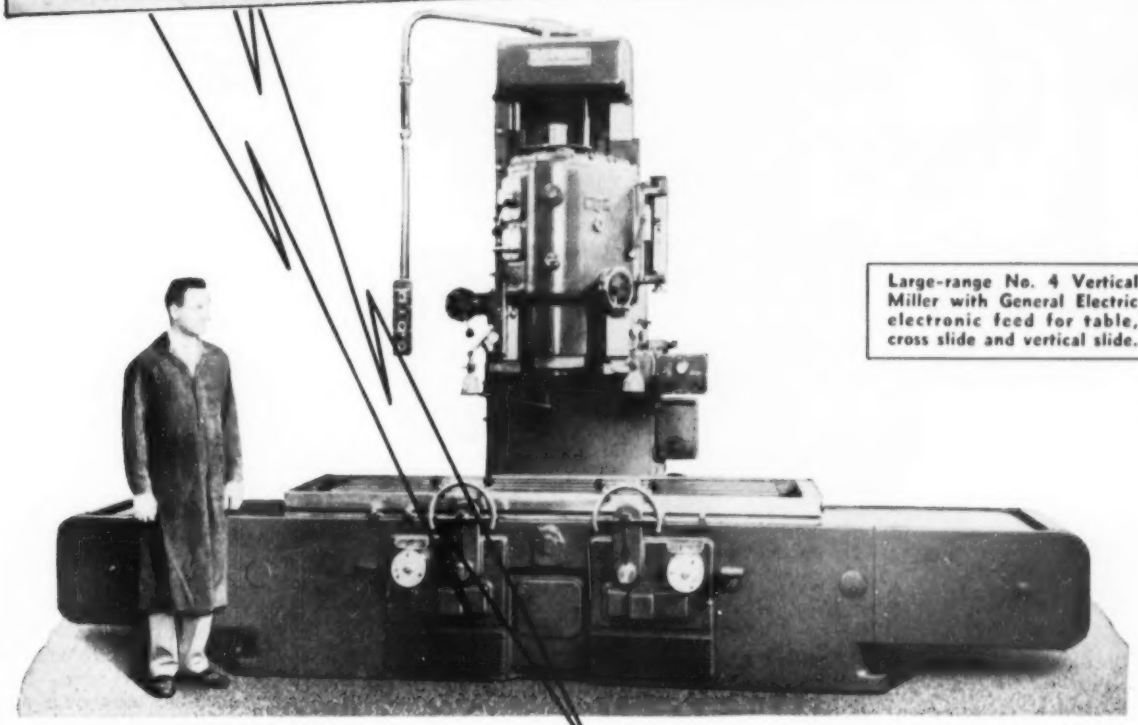
In due course, rumors reached me of increased shop interest in piecework and in the earnings of the man who was pioneering it. But I still held my hand when later I was asked to receive a deputation with a view to discussing piecework for all. The eighteen months' flight was over, piecework was accepted and introduced and, today, the pioneer who did not let me down is engineer superintendent in a colonial branch works. The secret, of course, was spotting the right man.

I cannot see where Butler could have any advantage over Morrison; rather the other way round I should say. In view of the fact that Morrison had already made the combination die, to make a repeat should be toffee for him, whereas, if Butler were given the job to do, he would start from scratch and would encounter and have to get round all the snags which Morrison met and overcame on the first die. If Butler made up the second die and if Morrison put him wise regarding the pitfalls to be met with and surmounted, Butler would then have some advantage over Morrison but, in the circumstances, it is most unlikely that Morrison would feel disposed to assist Butler to shine at his—Morrison's—expense.

The fate of the cross-check experiment is bound up with the problem of finding the right man. If Morrison were given the second die to make up, Ed would be saved a lot of trouble if he played his cards well by judiciously ministering to his vanity, and as a result of Morrison's experience on the first die.

"Whatcha writing, a blow-by-blow acount?"

LARGE RANGE VERTICAL MILLER with "ELECTRONIC" FEED



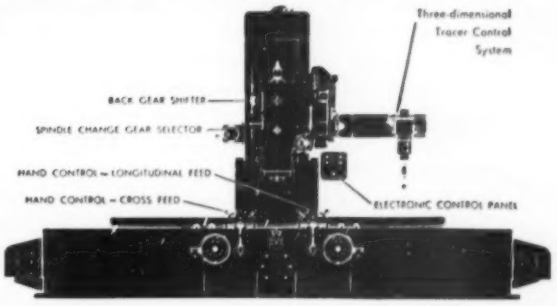
Large-range No. 4 Vertical Miller with General Electric electronic feed for table, cross slide and vertical slide.

Send for new No. 4 Miller catalog

REED-PRENTICE No. 4. Vertical Miller

SPECIFICATIONS: Machine Size	#4-60"	#4-96"
Longitudinal travel of table	60"	96"
Travel of cross slide	24"	24"
Table working surface	24 x 96"	24 x 132"
Feed range	½ to 25" per minute	
Spindle speeds 20 H.P. motor	45-1800 RPM	45-1800 RPM
30 H.P. motor	90-1800 RPM	90-1800 RPM

One–, two–, and three-dimension General Electric contour follower systems available. Full details on request.


Three-dimensional Tracer Control System
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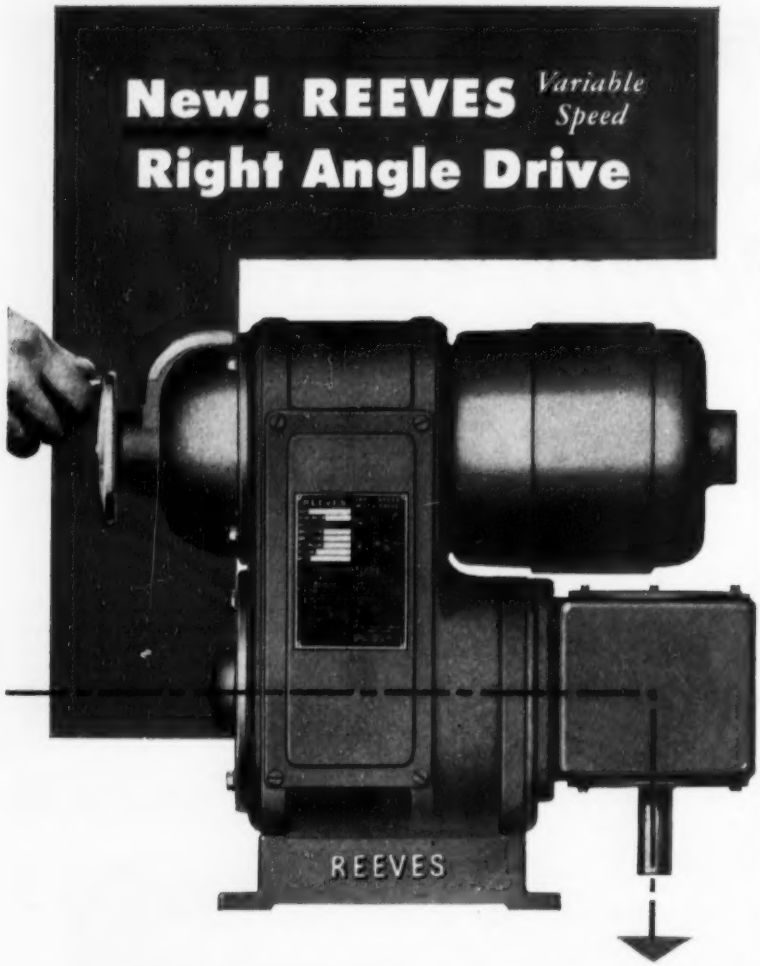

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Recognized leader in the specialized field of variable speed control

REEVES Variable Speed Drives

for accurate speed control

In this way Ed's point would be gained and shop atmosphere would not suffer.

I list Ed's mistakes on this matter as follows:

(1) Proposing to bluff by telling Morrison that he wasn't getting the second die to make because "doing the same thing over would get tiresome," when the real reason was Ed's dissatisfaction with the time Morrison spent on the first die.

(2) Proposing to tell Butler that Morrison took too long on die No. 1, and suggesting that he, Butler, should keep that information dark. A foreman should always be strictly truthful, whatever the cost, and he should not have secrets with any of his men.

M Donald
Lanarkshire, Scotland

The greatest wealth that a nation has
Is its men who work with a will;
And, when others sit on the doubting bench
Persist in believing still
That the way of work are the ways of men
Designed by a God-given plan,
And that progress is made in job and in trade
On the basis of man to man

—A A Nicholson

THE FOREMAN or works manager may have a good time in telling the employee it took him too long to do a job, but will the employee share his pleasure? There is no one thing that causes more resentment in the worker.

In this case Ed was only guessing on the time it should take to do the

"—Where in blazes did you dig up this timekeeper?"

job. It is only by sharing the work equally between all the employees that we learn the actual cost of the job. Telling one employee that the other fellow took too long to do a job will surely backfire.

We can, however, get things done by stimulating competition in the desire to excel by a friendly challenge. Every man likes the game. He wants the chance of self expression, the chance to prove his worth, to win, to excel—the same desire as the football player to win. The good coach knows by regulating the feeling he can control the action.

The skilled worker does not like to be stuck on one particular type of work. Where the work is of a diversified nature, it should be spread out equally. It is one sure way of finding out how long and how well an employee does the job.

A E Salmons
Philadelphia, Pa

•

DIEMAKING GENERALLY brings up something new in procedure in each job.

The man making one often is able to see after it is finished where he could gain some time if another one like it were required.

When a second one is required later, the general practice would be to turn the job over to the man who made the first one, if he could be spared from other work at the time. If the job is given to another, each of the men concerned naturally looks for an explantion of the reason for the change.

It depends very largely on the disposition of the two men concerned as to whether it was advisable or not to make a change.

The foreman's decision will prevail, and he should consider if he makes a change that, unless he proves his case to have advantage, he is sure to have one disgrunted man, more than likely each workman will feel hurt, which might easily have a lasting effect on the morale of all concerned.

Abel Blakeman
Watervliet, NY

•

DOUBLE STANDARD

TOLERANCES HAVE probably raised more ill-feeling between the design section and the shop than any other item on the drawings, and most of the time the shop is right.

Top designing engineers have a nice habit of giving all the tolerance the job will stand, whereas some of the less-experienced designers are

the *tougher* the cutting job . . .
the *better* the opportunity for . . .

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fussy and call for very close tolerance which the shop inspector is bound to demand compliance with, even if he knows that it is not needed. He knows that if he passes work not up to the demanded tolerance and should anything go wrong, then he will have to carry all the blame of incompetent inspection, because the design section sets the limits.

If all designers had to spend a year in the shop with layout and on the assembly floor, then there would probably be a big change in the final drawings, and the layout gang would be surprised at the ease with which this work could be done; machining and assembly would be a sweet job.

I remember once in Sheffield, England, seeing a man crawl out from under a special automatic machine. He was dripping with oil, swearing profusely and in his hands he carried a couple of cams. The shop manager happened to be passing. "Say, what's the matter, Tom?" he asked.

"Just changing the cams for the new set-up, sir. It would take an hour before the oil stops dripping and we can't lose that much time.

"Cams should be changed from above. I see a couple of handholes have been provided—why get underneath?

"Because the cams are much too tight to fit, sir. It takes a gear puller to slide them the four inches they have to go to clear the shafts.

"Who designed it?

"Ed Fitch, sir."

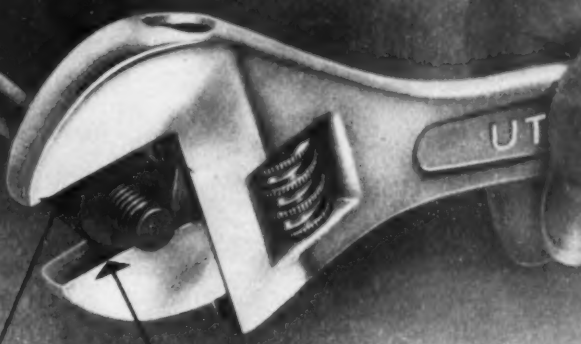
Soon Fitch arrived. "Who designed this machine?" asked the shop manager.

"I did," said Fitch.

"Then you change the cams," ordered the manager, "and afterwards —when you have had a shower—redesign those shafts. Make it a throw-on fit for the cams and taper the last inch with a push-off nut at the back, in addition to the regular clamp nut in front."

"Now, what's this about you wanting a raise, Bloodworth?"

Utica Wears Longer



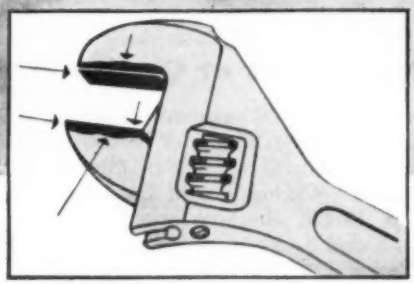
BECAUSE IT'S

INDUCTION HARDENED

RIGHT HERE

Jaw surfaces—those areas that take most wear and tear—are electronically induction hardened by UTICA'S own process.

Tests show that UTICA Adjustable Wrenches resist wear and burring up to 10 times longer than ordinary adjustable wrenches when subjected to identical usage.



Dark areas show where electronic induction hardens the jaw surfaces to resist burring and nicking.

Forged steel interior of the wrench is unaffected by the hardening. Retains its desirable toughness and resilience.

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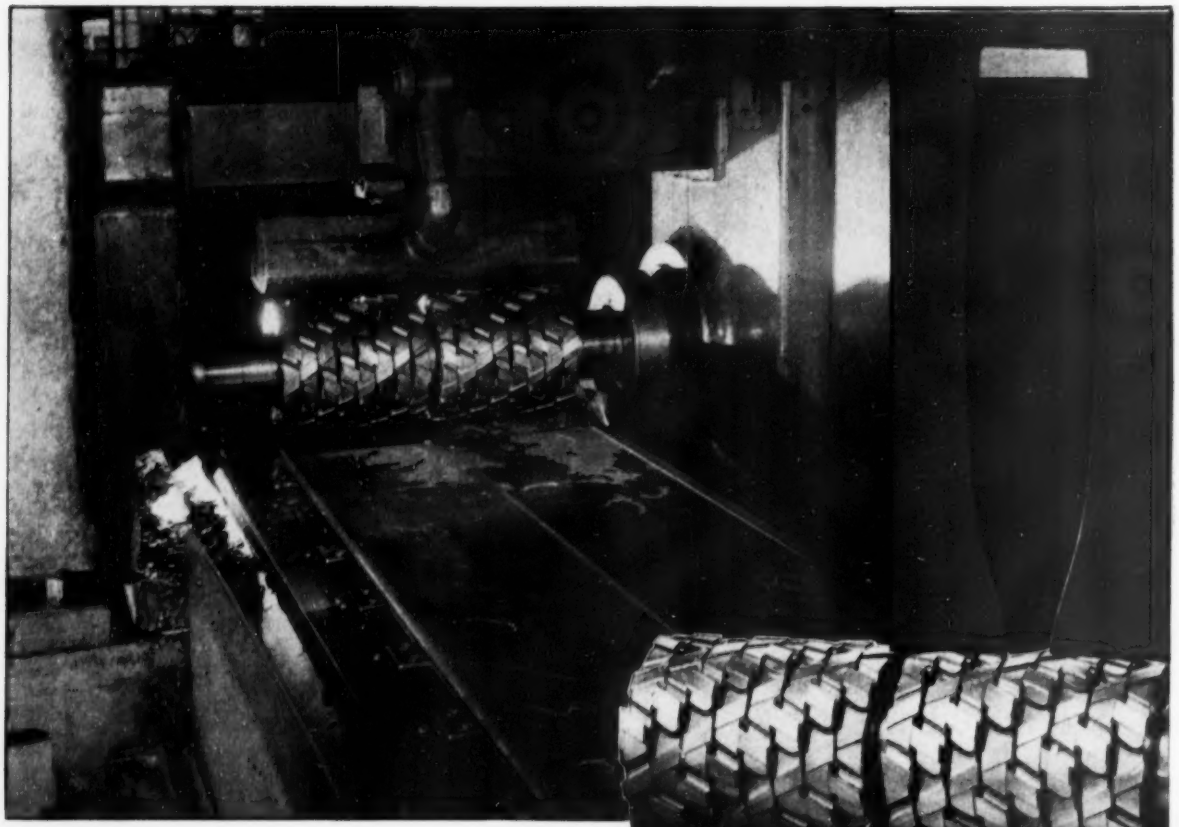


OK
alternate angle cutters
slab-mill tough chrome-nickel-moly prop blades at Curtiss-Wright

JOB DATA

FEED *8.25 inches per minute*

SPEED *30 revolutions per minute*

DEPTH OF CUT *from 0.055 to 0.10 inches*

LENGTH OF CUT *123 inches*

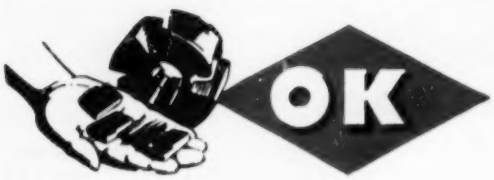
STEEL *Chrome-Nickel-Molybdenum alloy*

CUTTERS *16 mounted 8 and 8 for straddle milling*

Climb-milling the taper on 25 x 123 x .800" chrome-nickel-molybdenum steel plates for the famous hollow-steel propeller blades used on big B-36 International Bombers is regarded as one of the more rugged metal-cutting assignments at the Curtiss-Wright Caldwell plant.

For this second operation, 16 OK alternate angle cutters straddle the center rib of the blade, 8 and 8, are mounted on a 75 hp planer-type miller. The taper extends 123" increasing from 0.055 to 0.10". The cutters are standard OK alternate angle mills with overlapping high speed steel blades. The angular set gives a shearing action, coiling and turning the chips away from the cut. Streamline in design, OK cutters are free from pins, screws, gibs and locks. They pack huskier blades for heavy cuts and more blades per body for finishing cuts. Blades are secured by a driving fit. Mated serrations in body and blades prevent any lateral movement and provide a fine scale adjustment to compensate for wear.

A copy of the OK catalog 13, "Modern Milling Cutters for Modern Milling Machines" is yours on request.



modern milling cutters for modern milling machines

THE OK TOOL COMPANY, Milford, New Hampshire

I heard later that Fitch became a first-class designer after his practical experience.

Then there was the designer of a tractor in Illinois who had the kingpin ball bearings built to a very close tolerance and nearly wrecked the firm because those tractors kept coming back because of seized bearings. The designer was an old auto man. The job of correction was turned over to an experienced agricultural designer who junked the ball bearings, drilled a good clearance in the plain bearings, and drilled a hole through the kingpin shoulder so any dirt or sand that got into the bearing could work its way out again and fall to the ground. It worked, even if it was a sloppy fit, and gravity did the cleaning job.

Tolerances have done a big part in mass production interchangeability, but manufacturers have to sell the stuff, so don't try to make every piece like a Johansson Block.

George P Pearce
Albuquerque, NM

•

ADLAI or IKE

How much time should be allowed for shopmen to discuss politics or similar subjects during working hours? Will forbidding such discussions tend to arouse resentment, and indirectly lower morale? Or is it preferable to permit a reasonable exchange of ideas, so long as production is maintained?

THE DETERMINED foreman called his men together, rolled up his sleeves in preparation for a good job, placed his hands on his hips and let 'em have it.

"I've called you fellows away from your work for a few minutes to discuss something of vital interest to all of us. I've noticed several times of late that some of you take considerable time in discussing politics and various other things in season. This is good in moderation, and I don't object to it in the least, but there is a limit to everything.

"It behooves us all to be concerned over the welfare of the country and to weigh the merits of the various men who are entrusted to direct the national economy, but while we wrangle over the selection of the leaders in Washington, let us not fail to realize that the life of this firm is dependent upon production. If you fellows are going to interfere with this production by spending too much time wrangling over national issues, what chance has the firm got in keepinug its head above water in this cold war of competition? A

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Three types, all fully adjustable—Comfort King round rubber, flat rubber, or elastic.
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Screw-type retaining rings permit quick lens change from front. Standard 50mm lenses set flush with rings to deflect flying objects. Chippers style has indirect ventilation through slotted lens rings and direct ventilation through perforated side shields. Welders and dust models have indirect ventilation through side shields. Simplified bridge adjustment. Choice of 3 adjustable headbands: elastic, flat rubber or Comfort King round rubber.

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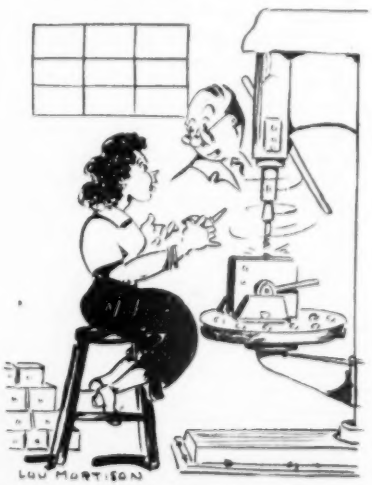
smooth-running administration is a good thing, but I would think that you fellows would be interested primarily in a shop that was making profits. That's all, fellows; think it over."

Then the foreman strolled away to his desk while the men quietly returned to their various jobs around the shop.

Call this the direct approach if you will, but to my way of thinking it packs an effective wallop in the minds of the men. There is no personal resentment as might arise were the boss to jump on one or two of the guilty ones. In putting the issue this way, the boss makes it known that his advice comes directly from the heart and the men will show it considerable respect. There is no doubt about it that gangups are time-consumers, and show considerable thoughtlessness on the part of some of the men.

In the old days when Bryan and McKinley were plugging for a shot at the presidency, they did not resort to personalities as seems to prevail in the modern campaigns. The old timers wouldn't cluster about and eat up the company profits or they would soon be told to get another two-bit-an-hour job somewhere else. The men would anticipate an evening where freedom from higher-ups would not obstruct the smoothness of discussion. Hurrying through their suppers, like a bunch of kids anticipating a swim, they would gather at the local bar and rest their weary feet on the brass rail of fellowship, and argue pro and con. An occasional fight would take place now and then and the wagon would travel over the cobblestone pavement throughout the night. But the shops



"Ok if I leave half the drill in the iron block?"

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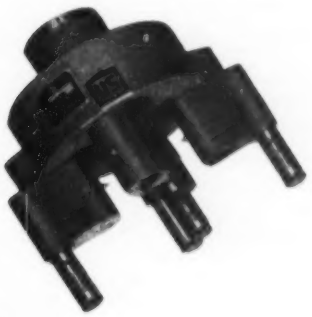

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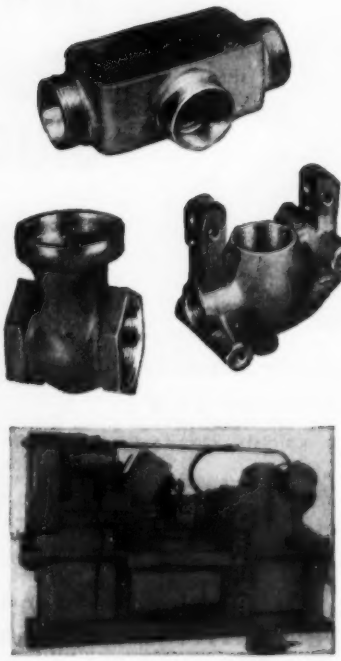
Here's an ideal machine tool for small lot requirements because of quick, easy changeover. Any class of chuck work can be handled economically in any quantity.



The examples of work shown here are typical of the wider variety of parts being produced on these new machines.

SEND FOR detailed information on this new machine. Let us have samples of your work in order to give you time and cost estimates for handling it on the "1-2-3" Goss & De Leeuw.

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would buzz with active machinery during the day and the men would turn out their work without unnecessary interruptions. We've traveled a long way since the days of squeaking belts!

J Homewood
Ontario, Calif

•

NOW THAT THE tumult and the shouting has died away, and a new President has been elected, political discussions in the shop have dwindled to the post mortem stage with the Monday morning quarterbacks giving their reasons why Adlai didn't make it. Soon, the recent election will fail to arouse interest as a topic of conversation, but you may be certain that the shop-discussion society will never lack a quorum even should they have to fall back on that hackneyed theme, the weather.

From my own experience, the only thing a foreman can do about it is see that it isn't overdone. One thing is certain—any foreman or supervisor who thinks he can eradicate these shop gab-fests by dirty looks or disciplinary action is a fit candidate for the men with the white coats and the butterfly-net. Because it is a safe bet that the Roman taskmasters were plagued by the same harassing situation at the building of the Coliseum, and before them their Egyptian counterparts at the raising of the Pyramids. If they had any solutions to the problem of keeping the noses of the honest tradesmen of that day to the grindstone, they failed to pass it along. I feel sure they occasionally looked the other way when they came upon two or three of the boys involved in a discussion, whether it was on chariot races, or regarding the latest love interest of the current Pharaoh.

So, Al, don't let it get you, although it is a wee bit irritating when

"Oh, yeah! put on your safety glasses and say that!"

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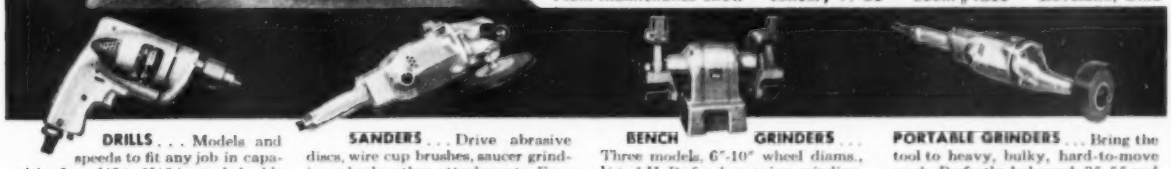

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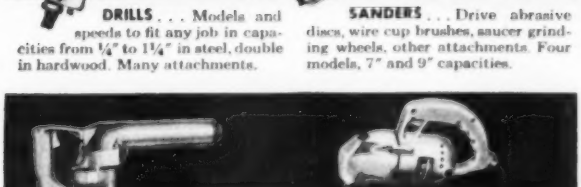

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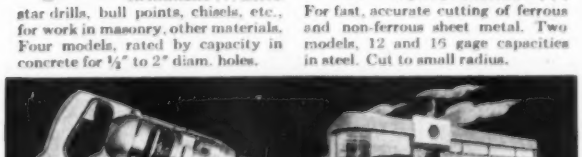

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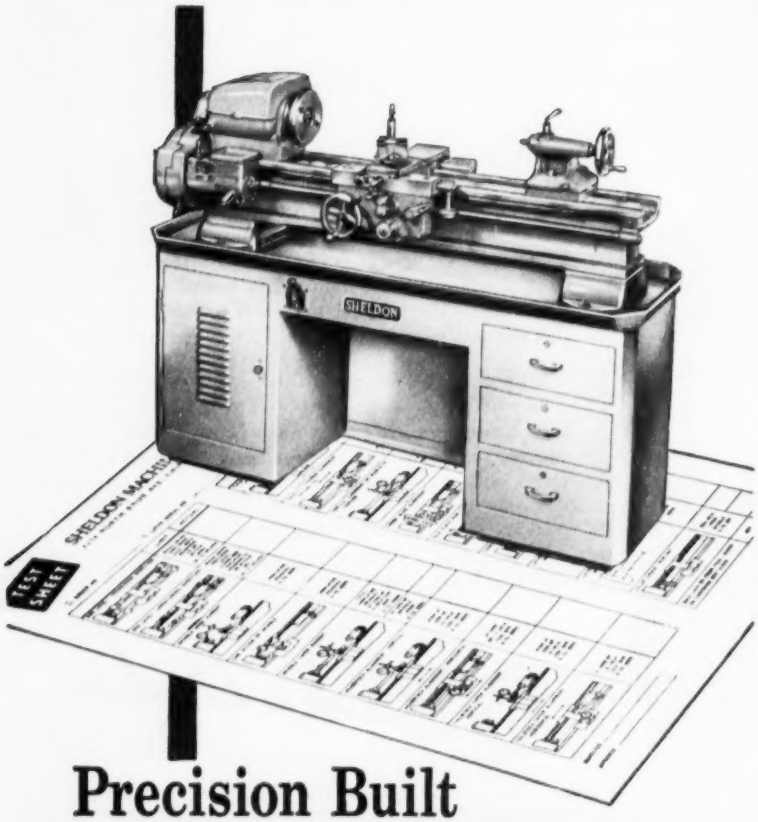

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you are having trouble meeting a tight production schedule to come upon several of the boys shooting the breeze when they should be in there pitching.

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In this imperfect world of ours there are too many good men walking around with ulcers, and quite a few of them are shop foremen who forgot the Biblical injunction to "muzzle not the ox that treadeth out the corn."

Robert S Alexander
Greenville, RI

•

WHEN WE ACCEPT a job in an organization it represents a pledge that we will accept our responsibilities and obligations. We try to pick a job that has good working conditions at the best pay. We expect paid holidays and vacations. If the work week is 40 hours, we expect 40 hours' pay. If we work over 8 hours a day or more than 40 hours a week we expect time and a half.

The firm who pay us for 40 hours naturally want 40 hours' work. The employee is supposed to be intelligent enough at his particular job to do the best he can, whether it is running a machine, managing an organization or scrubbing the floor.

We cannot, however, tell the employees they cannot talk on the job. It would be useless and a waste of

"She loves me—she loves me not!"

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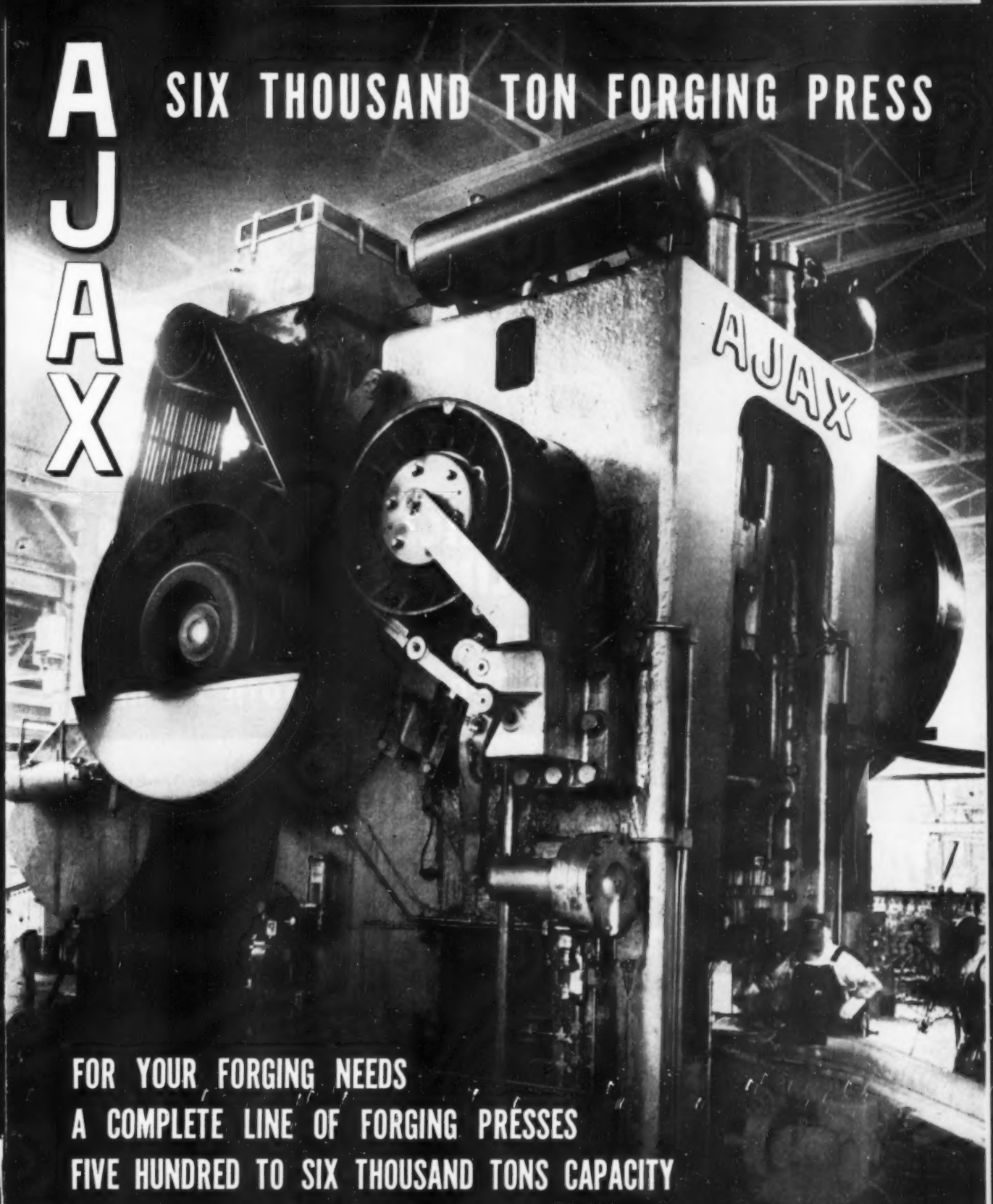

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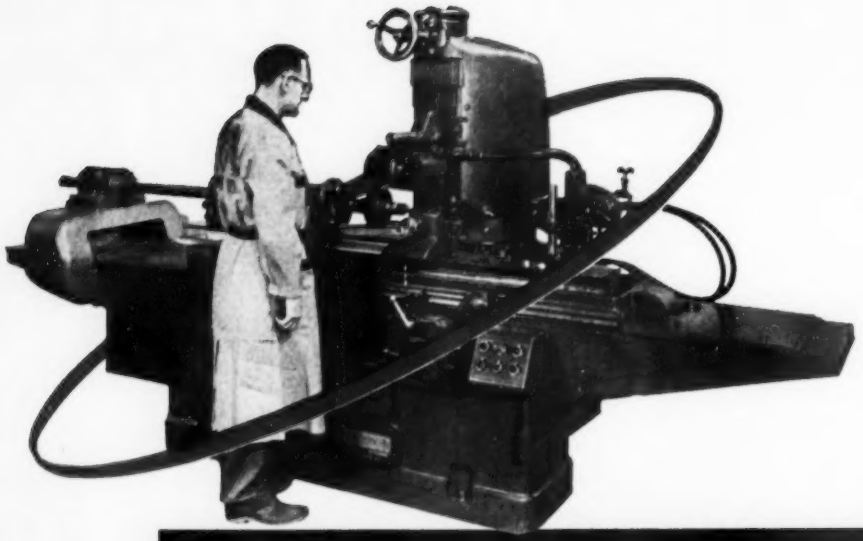
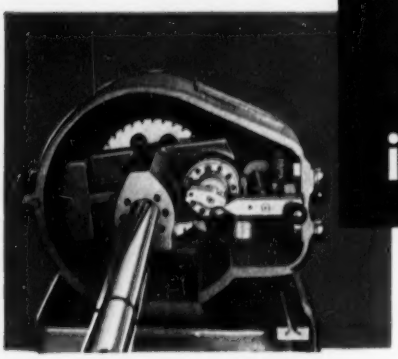


Indexing mechanism of the Helical Grinder



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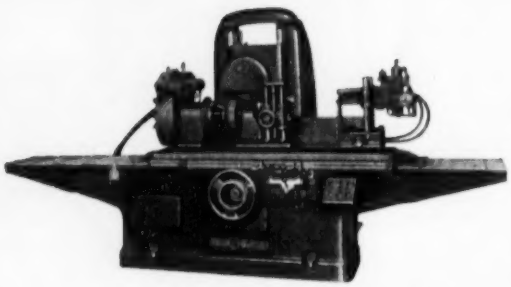

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time to tell them that politics are taboo in the shop.

I personally have no objection to employees discussing politics on a man-to-man basis. Employees are intensely interested in a coming election. One group still remembers the depression. This group is afraid someone will try to deny them the right to bargain. They are also afraid they will lose all social benefits.

The other group does not like the 45¢ dollar. They are afraid it might change to 25¢ before they get it out of their pay envelope. They are alarmed about corruption in our government. They are worried about high taxes and Communistic activities. They are deeply concerned about these things, and will discuss them at every opportunity inside or outside the shop. So long as they do so it is our job to see that they do not gang up in lengthy argument. The best thing we can do is see that it is not overdone.

Albert E Salmons
Philadelphia, Pa

•

CAN A MAN STEP DOWN?

Is it a reflection on the foreman when a man he has picked for his assistant must be demoted? Will he be blamed for his initial poor judgment? Will the worker be more likely to resent the demotion, or realize that he was not yet quite ready for the job? Readers' opinions vary . . .

DEMOTING A MAN because his superior is of the opinion that the man does not measure up to what was expected of him is a very risky procedure. In the first place, it is obvious that the superior did not use good judgment in his choice, and in the second place, he should never have made a move that would put him in a position of having to admit to all the employees that his judgment of men was unreliable. Furthermore, the demoted man will be considered either a martyr or a joke according to his popularity at the plant; in either case the company will be the loser.

It would be far greater for the superior to explore thoroughly the possibility of training the man to fill the position. No one should expect a man the moment after he is advanced to the position of assistant to know automatically all the details and ramifications of his new job. The probabilities are that for the first few months he will be more of a hindrance than a help. If the man is conscientiously trying to fill his job, he should be given all the advice possible. Should he develop a

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swelled head and try to be bossy to his subordinates—and this often happens—then a serious talk on the subject in a private office is called for.

Should it unfortunately prove to be a case of bad judgment in the first case, and the man proves to be lacking in capacity to handle the job, then he should be given a reasonable time to find a new job and resign. But before this irrevocable step is taken it is advisable to make sure that the man does not have some family or other worry on his mind that may possibly be overcome; a sick wife or child plus a financial collapse can temporarily wreck even a very competent man; he is in need of help and consideration and not rough discipline.

When an executive finds he is in real need of an assistant then it is best to pick the man who seems to be worthy of the position and tell him that he is to "come in the office and help out on a rush of work." If after a few weeks it is apparent that he is not the right selection, it is a simple matter to thank him for his help and let him return to a job that is within his capacity, and no harm has been done. A week or so later a similar "emergency" can arise and another choice tried out. The satisfactory man can then be kept on for two or three months and eventually be permanently established. At that time the announcement of the promotion and the authority that goes with it should be made.

George P Pearce
Albuquerque, NM

•

THE PROBLEM the supervisor faces when he has made an unwise choice of assistant is a trying one and cannot be resolved without a certain loss of face to all concerned.

The supervisor should, of course, have been wise enough in the first place to judge the character and the working goals of the man he chooses as an assistant. In my opinion, the choice should be based perhaps first on ability, but almost equally as important, upon his capacity for loyalty to the man he is to assist in the running of the shop. Without this capacity for loyalty and capacity to cooperate as a team with the supervisor, he does not have the makings of a good assistant regardless of any other qualities he may possess for the job.

However, to return to the problem faced by a supervisor when he has chosen an assistant who is ruthlessly ambitious for himself alone. In my opinion, the situation should be faced with a clean operation. The

personality and character of the assistant cannot be changed. Even if the supervisor has a heart-to-heart talk with him and the situation is corrected for awhile, it is only a question of time until the old conflict arises again.

The ideal solution is a transfer of the assistant to another department. However, if that is impossible, there is nothing to do but return him to his former job and hope that time will cause everybody to forget about the unhappy promotion and demotion. In fact, it could be helpful if the supervisor admits to the men working close to the assistant in his old job that a mistake was made, and ask them to refrain from kidding the "promoted—demoted" employee.

A certain amount of face is bound to be lost by the supervisor. He has made a sizable error in judgment when he chose the wrong assistant and the consequences must be faced. There is no easy solution to this situation. He can only try to do better when he chooses his new assistant and realize that it takes a particular type of personality to fit into an assistant's job.

E George
Dayton, Ohio

•

I HAVE SEEN many leaders and foremen stepped down and every one of them was resentful or discontented. They often cause bad feeling and discord in the department. Some of them become stewards in the union, but anyone who has been in the management picture makes a poor steward.

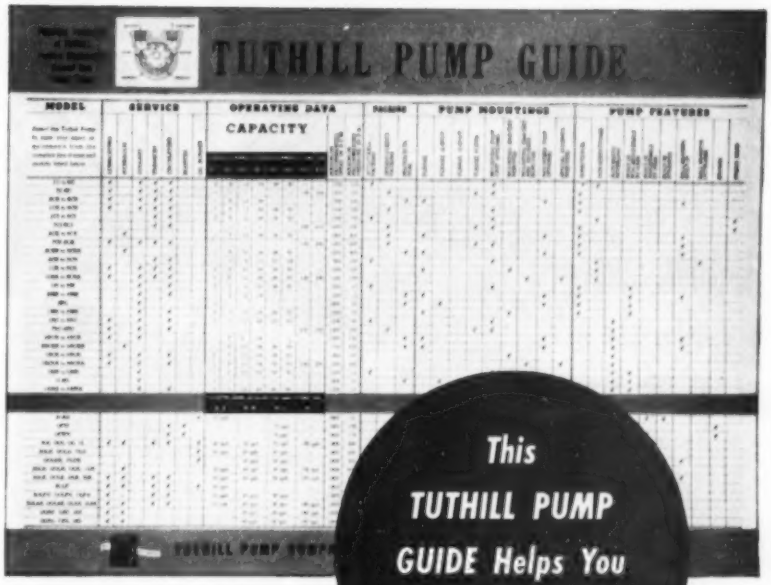
A good plan when more supervision is needed is to pick an employee as a leader instead of foreman or assistant. It is a good idea to tell them it may be only a temporary arrangement, but that you want them to get the experience. If they then show the capabilities to handle the job of supervision, they can be placed on a permanent basis.

In this case Al should have more proof than he has at this time before he demotes Bingham. The few hints he has heard may be idle gossip, or exaggerated. Many men make mistakes in their desire to be somebody.

If I were in Al's place, I would have a serious talk with Bingham. I would tell him what the score is and what is expected of him in the future. We all make mistakes in our relations with others and we are often able to turn them to profit.

A E Salmons
Philadelphia, Pa

NEW EASY WAY TO SELECT THE RIGHT PUMP FOR THE JOB



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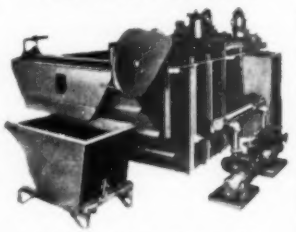

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This annual volume contains lists of member companies classified by products and services; an alphabetical directory of member companies; trade associations classified by products and services, and alphabetically; and lists of brands, trade names, and trademarks. The introductory section of each chapter is printed in English, French, and Spanish.

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THE PRINCIPLES OF PHYSICAL METALLURGY (THIRD EDITION)—*By Gilbert E Doan, manager of Metallurgical Research, Koppers Co. Published by the McGraw-Hill Book Co, Inc, 330 W 42nd St, New York 36, NY. 331 pages, 6 x 9 in. Price $5.50*

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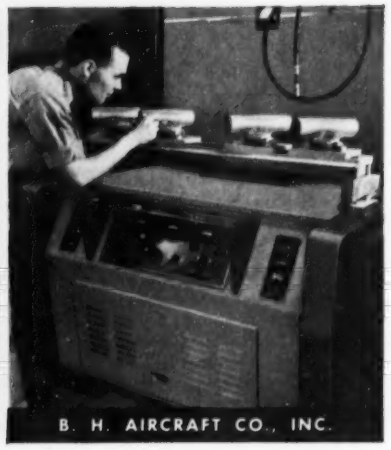

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If you have a heat-treating problem, bring it to Westinghouse. In company after company . . . large or small . . . regardless of product, Westinghouse installations are saving time and money. Accurate and rapid heating of selected areas is inherent in the Westinghouse processes. Write for fuller information: Westinghouse Electric Corporation, Electronics Division, Department 55-3, 2519 Wilkens Avenue, Baltimore, Maryland.

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J-02255

them in Metalworking. As in the earlier editions, the subject of physical metallurgy is approached from the standpoint of classical physical chemistry and physics.

Metallurgic properties are explained as far as possible in terms of atoms and electrons instead of merely comparing metals as to these properties. Material on mechanisms of deformation and annealing has been revised in accordance with recent findings and attention has been given new testing methods such as ultrasonic testing, brittle lacquers and strain. New casting methods have been added, including investment and directional solidification methods for sand castings.

This text is intended for the student who wishes to understand principles and theory. It is not intended to deal in detail with alloys of one type because this is to be done in later works.

•

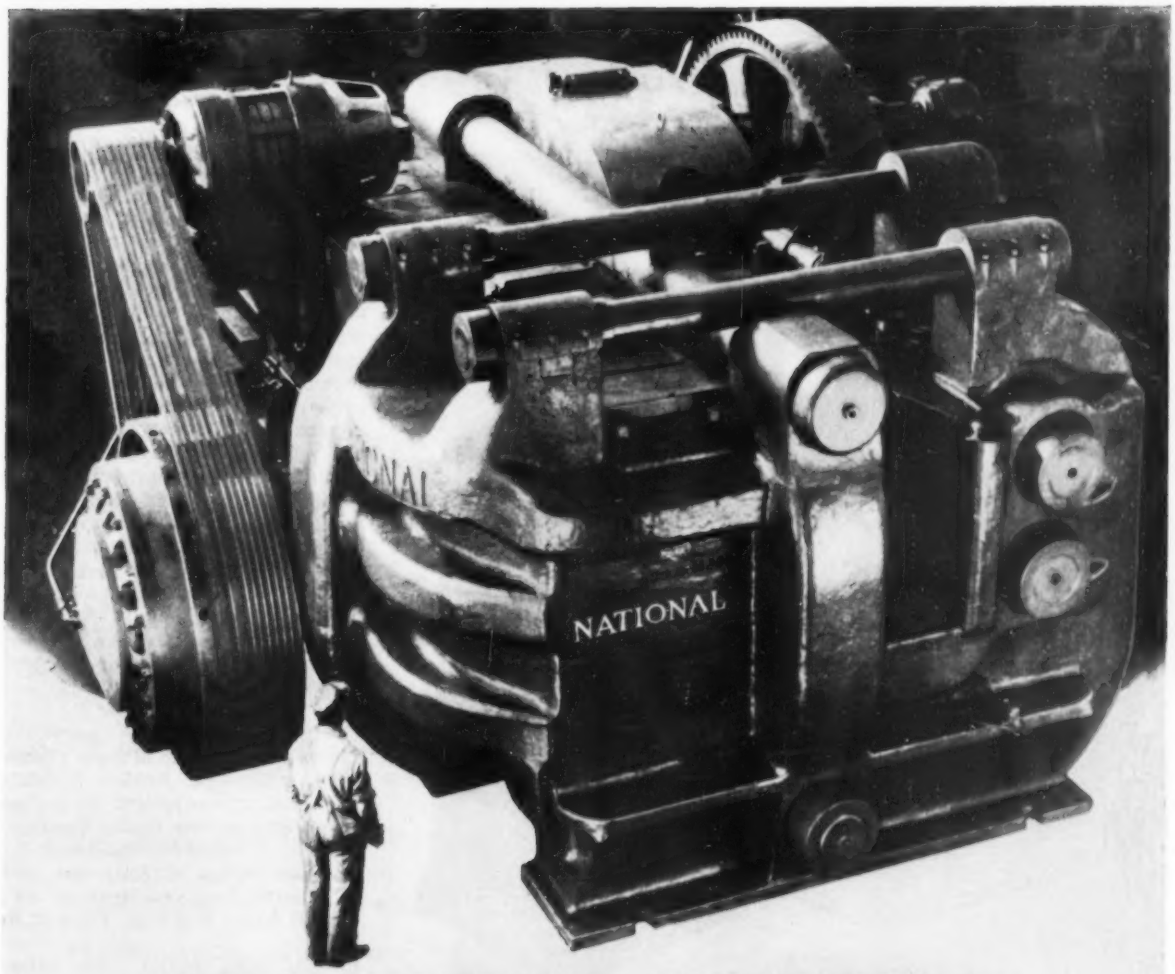
STANDARD METAL DIRECTORY (13TH EDITION) *Published by the Atlas Publishing Co, Inc, 425 West 25 St, New York, NY. 927 pages. Price, $15.*

This reference book for those in any branch of the steel or metal industry has been enlarged and completely revised.

The directory is divided into four sections: iron and steel plants; ferrous and non-ferrous metal foundries; metal rolling mills; smelters of non-ferrous metals.

The directory contains more than 10,000 detailed reports on steel mills, foundries, smelters, rolling mills and non-ferrous metal plants located in the United States and in Canada. Plants are listed geographically and alphabetically. Reports give the

"Have you noticed your machine isn't on a level?"



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DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

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Another EXCLUSIVE FEATURE *of*

REID GRINDERS

REID had the worker in mind when this feature was incorporated. *Instantly accessible, always visible, constantly protected;* a transparent shatter-proof panel cover keeps out dust and prevents accidental contact. This forward-looking design feature simplifies inspection and adjustment when necessary. (Full J.I.C. controls available for all models)

Every feature of the Model 618-V is made functional by Reid's constant effort to increase precision while simplifying an essential machine tool for easier operation, and improved output.

CAPACITY: 6" x 18" x 15¼"
WORK TABLE: 51" x 8"
POWER FEED, TABLE: 12-35 ft./min.
STANDARD WHEEL: 7" x ½" x 1¼"
FLOOR SPACE: 70" x 36"
WEIGHT: 2,000 lbs., crated 2,225 lbs.

For more features *of value to you,* write for Bulletin 618-1.

Reid Brothers Company, Inc.

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name of the company, its capitalization, plant equipment, products manufactured, primary and secondary raw materials consumed, names of company officials, purchasing agent and sales manager.

In addition, the directory contains special lists of: distributors of pig iron, ores, ferro-alloys and new metals; coke ovens in the United States; fabricators and distributors of iron and steel products; metal stamping plants; forging manufacturers; manufacturers of die castings; metal powder producers and sellers; smelters and refiners of primary and secondary non-ferrous metals; storage-battery manufacturers; galvanizing plants; aircraft manufacturers; automotive-vehicle manufacturers; dealers in used pipe and rails; scrap-iron and scrap-metal dealers; importers and exporters of ferrous and non-ferrous metals and metal products; dealers in used structural steel; operators of hydraulic presses; railway purchasing agents and manufacturers of equipment and supplies.

•

CONTROL OF ELECTRIC MOTORS (THIRD EDITION)—*By Paisley B. Harwood, vice-president in charge of Engineering, Cutler-Hammer, Inc, Milwaukee. Published by John Wiley & Sons, Inc, 440 Fourth Ave, New York 16, NY. 538 pages, 6 x 9 in. Price $7.50*

In this third edition, new information has been added on circuits, devices, and calculations employed for regulating voltage, speed and tension in electric motors. Numerous industrial applications are described, as are electronic amplifiers, rotating regulators, positioning servomechanisms and the basic principles of regulating problems. New photographs and wiring diagrams

"After getting only one raise in forty years, this lousy clinker of a watch comes to me as no great surprise."

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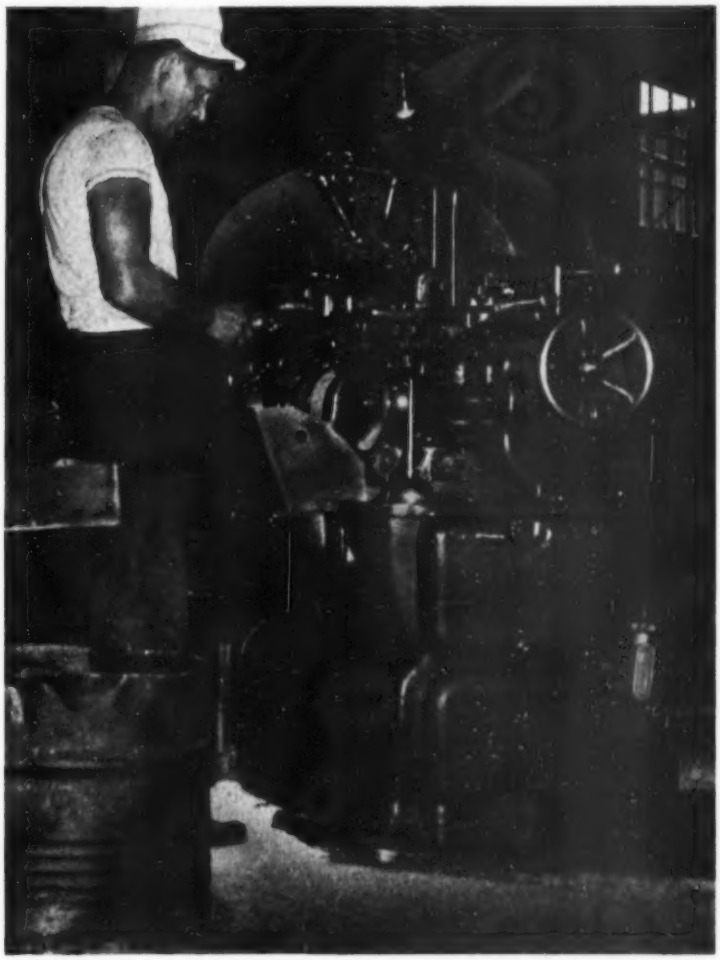


"The Highland Machine and Screw Products Co. (Highland, Illinois) specializes in automatic screw machine work...

...therefore quality lubricants are a MUST for our equipment," states President C. J. Zimmermann.

By experience, Mr. Zimmermann has found that "Sinclair WILKUT 'A' not only increased tool life on our Brown & Sharpe Automatics by approximately ⅓, but it also improved the finish for the machining of non-ferrous metals and free machining cold rolled steel. In addition, because of the non-corrosive action of WILKUT 'A', both ferrous and non-ferrous metals can be run on the *same machine*.

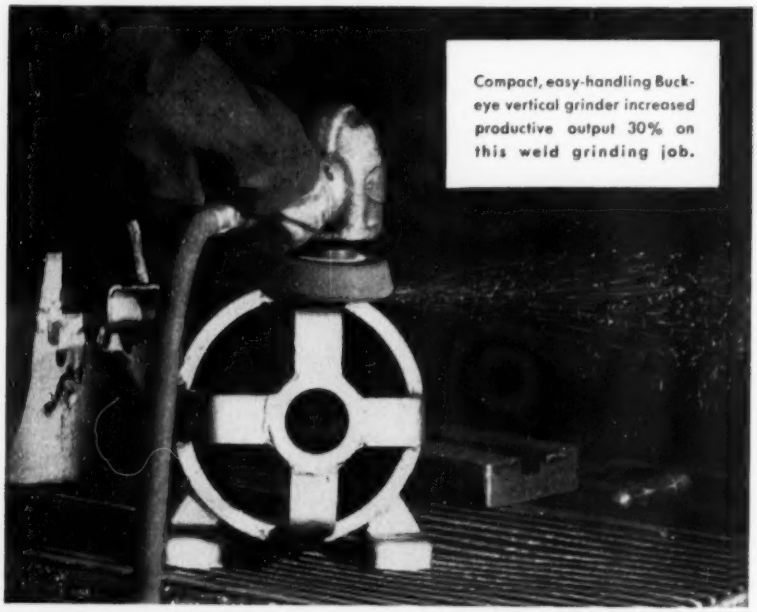
"We also find Sinclair UMBRA® Cutting Oil a 'natural' for threading and machining of the more critical steels. We *are convinced* that the performance of Sinclair lubricants has minimized maintenance and operating costs in our plant."

Invite a Sinclair Lubrication Engineer to consult with your Maintenance Superintendent by calling your local Sinclair Representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR CUTTING OILS and COOLANTS for Metal Cutting

(WILKUT – Reg. U. S. Pat. Off.)

▶ increases output 30% on grinding operations



Compact, easy-handling Buckeye vertical grinder increased productive output 30% on this weld grinding job.

In a routine check of production operations, a welding equipment manufacturer discovered a grinder operating well below the RPM recommended for the work being done.

Replacing this tool with a Buckeye 6,000 RPM vertical grinder resulted in an immediate increase of 30% in productive output on this grinding job. In addition, the lighter, more powerful Buckeye grinder helped improve product quality, reduce tool maintenance costs, employee fatigue.

All of which proves it's very important to select the right tool for the job—and very expensive to go on using older, less efficient tools.

▶ what are you waiting for?

The right tool for your job may well be described in the Buckeye air or electric tools catalogs. We'd like to send you either—or both—without obligation, of course.

Buckeye Tools CORPORATION
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Portable Air and Electric Tools for Industry

IN CANADA: Joy Manufacturing Co. (Canada) Ltd., Galt, Ontario

replace outdated ones, and all the references have been revised and expanded; in addition there are 350 problems.

Like the last edition, this one is arranged entirely by motor types. The book begins with a general discussion of wiring diagrams, construction details and pilot devices as applied to all kinds of motor control, covering controller design, construction and application. Divided into two sections, one is devoted to d-c motors and motor control, the other to a-c motors and motor control. In each section, the operation, characteristics, and application of each motor, the methods used to control it, and the actual design of the various types of control for that particular motor are described.

•

WELDABILITY OF METALS. *Published by the Lincoln Electric Co, 22801 St Clair Ave, Cleveland 17, Ohio. 195 pages. Price 50 cents.* Reprinted from the 9th edition of Lincoln's *Procedure Handbook of Arc Welding Design and Practice*, this book contains the entire content of Chapter 2.

It gives the answers on how to weld ferrous and nonferrous metals and explains the factors that determine weldability. Causes and cures for hard-to-weld metals are given, as well as detailed procedures for welding iron, steels, nickel, copper, aluminum, and various alloys. A thorough analysis of the principles and practices of hardfacing is presented, and specifications for all types of electrodes are given, together with complete tabular data, drawings, and photographs.

•

METAL DRAWING—RULES, CALCULATIONS, EXAMPLES—*By B Wassilieff. Published by Dunod 92 Rue Bonapart, Paris. 76 pages. Price $1.25.*

Written in French, this book, despite its small size, is an excellent work on a subject on which there is a noticeable shortage of material. It covers briefly but effectively the principle of drawing, punch and die clearance and radii, lubrication, speeds, pressures, blank layout, and reductions in dia. Other chapters give practical examples of cylindrical, conical, hemispherical and rectangular draws, together with the methods of calculating the necessary pressures and press sizes.

Now

. . . you can change resistance welding die set-ups in a matter of seconds . . .

with the new

MALLORY "Nu-Twist*" DIE ADAPTOR

It's just as easy as it sounds, too. By using different electrode inserts in the "Nu-Twist" die adaptor you can handle several resistance welding jobs with only one die set-up. You can change from one job to another in a matter of seconds . . . without switching basic dies . . . without tools.

Mallory "Nu-Twist" die adaptors save set-up time and reduce die inventory. They are especially well suited for shops that have small run resistance welding applications such as projection welding, single spot welding and electrical upsetting. They are designed so that all the operator has to do is turn the locking nut by hand, slide out the electrode insert, slip in the one for the next job and turn the locking nut. The entire operation is as fast and simple as that.

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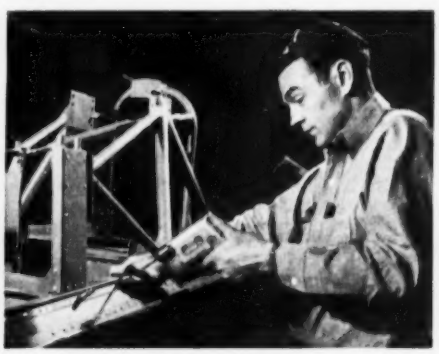
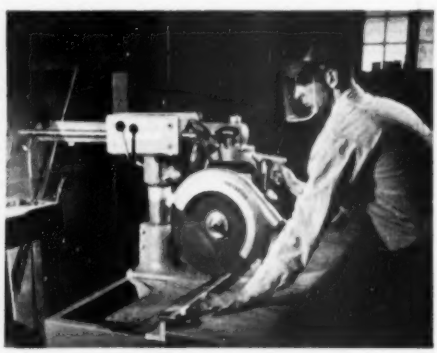


John Huber uses the SKIL Pneumatic Drill, Model 1013, to drill rivet holes in a door assembly. There are now 32 models in the SKIL line of air tools. Unequalled for compactness, low maintenance, durability.



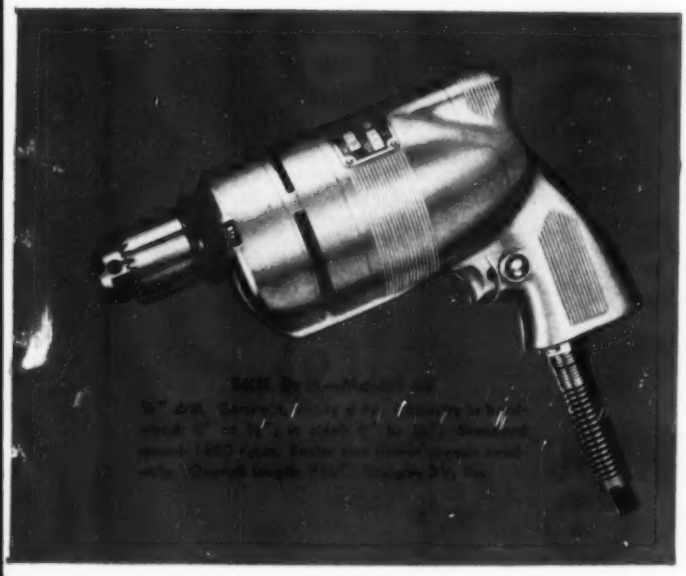
Charles Hupe cuts steel tubing with the SKIL Radial Saw, Model 450. He says, "We also speed work and insure accurate cutting by using this great tool to saw aluminum extrusions, plus wood and trim parts."

"We standardized on SKIL Drills for low maintenance, local factory service,"

—says **Roy Berger,** factory manager,
CASTLE INDUSTRIES, INC., Paine Field, Everett, Washington

Ernest Brevik uses SKIL Drill Model 47 with floating drill guide in assembly work. He says, "Compact size of this SKIL Drill makes jobs like this possible. They have more power for their size than any drill I've used."

"We use 25 Model 47 SKIL Drills constantly in our subassembly of aircraft parts and manufacturing of precision stainless steel and aluminum products," says Mr. Berger. "We give portable tools long, tough use, and *must* have parts and repair service available. The local SKIL Factory Branch Office is the answer. However," he continues, "due to SKIL quality, maintenance has been very low, performance has been the best! SKIL Drills are first-rate—light-weight and compact, ideal for aircraft production."



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SKIL Products are made only by SKIL Corporation
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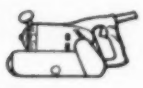
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Every Application Saves Time and Money!

IN ADDITION to the common uses, bushings, bearings, washers and thrust plates, certain manufacturers are making bronze gears, sheaves, trolley wheels, rollers, guide rolls, air tool tips, etc., from Johnson Universal Bronze. There are reasons for wider use of this material: ease of machining, corrosion resistance, non-sparking properties, long life, less frequent replacement . . . to mention a few.

Johnson Universal Bronze is available from distributors' stocks in over 400 sizes. Round bars, solid or cored, are completely machined, OD, ID and ends, and are usable from end to end . . . no waste. Hexagon bars, not machined, are made in a range of sizes, too. Investigate the possibilities of using Universal Bronze for special applications in your industry. Write for catalog, showing sizes available.

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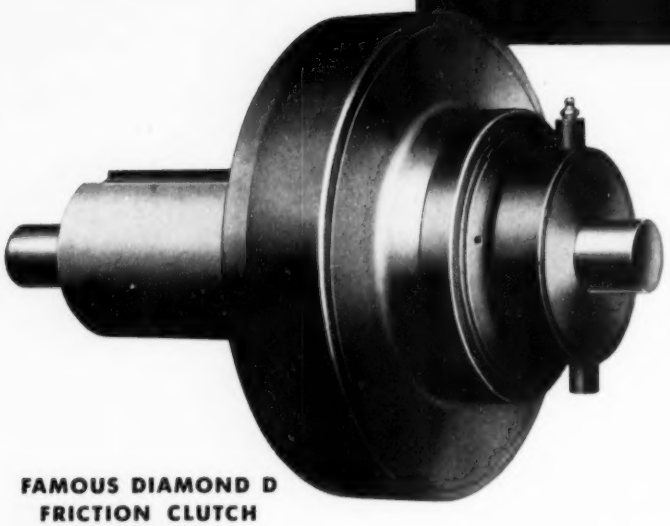
"NO TOGGLES!"
1/3 to 21 H.P. CAPACITIES

DODGE FRICTION CLUTCHES

Proved in thousands of industry's toughest jobs!



FAMOUS DIAMOND D FRICTION CLUTCH
CAPACITIES UP TO 470 H.P.!

Look to Dodge for the clutches to meet your specific needs. Dodge leadership in the field of mechanical power transmission is strikingly evidenced in the advanced design and engineering of a complete line of friction clutches, in a full range of sizes with capacities from 1/3 hp to 470 hp.

ROLLING GRIP FRICTION CLUTCH

New and simplified design gives new ease of control with positive drive and extreme ruggedness. There are no toggles! Instead the mechanism shifts smoothly on hardened steel balls—and has the positive grip of a wedge. (Operating parts enclosed for safety yet quickly accessible for service). Available from distributors' stocks in two types—Bolted Plate or Gear Tooth Mechanism in sizes from 1/3 hp to 21 hp at 100 rpm.

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Built with the stamina for grueling service, this rugged clutch has a world-wide reputation for dependability. It's compact, too—completely enclosed in both engaged and disengaged positions. Adjustment is simple—an Allen wrench at one point does the job. Available in single, double or triple friction plate design in several types of construction. Capacities from 21 hp to 470 hp at 100 rpm.

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COSTS LESS THAN
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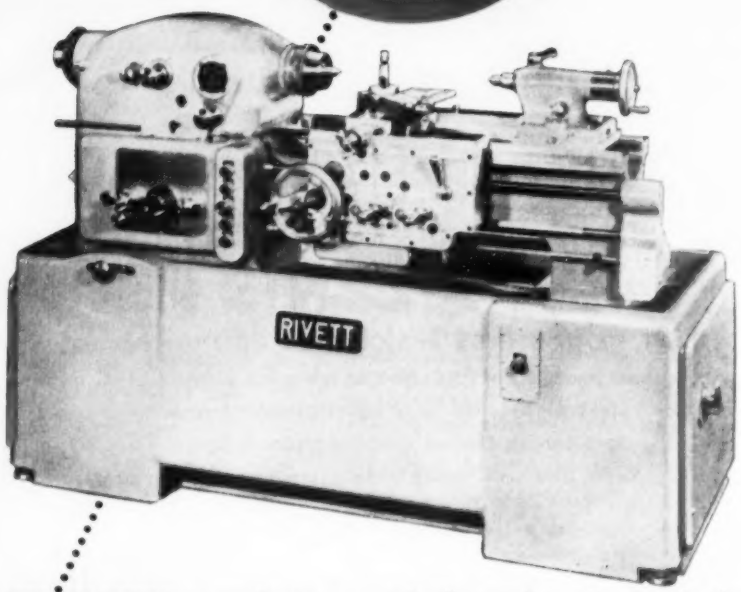
2 FOR 1

RIVETT 1020S

HAS WHAT IT TAKES TO MAKE AN OUTSTANDING LATHE

★ 40% heavier than comparable lathes. Weighs 3900 lbs. ★ Back gearing for power cuts—belt drive free of all gearing for high speeds. Range from 22 to 3600 R.P.M. ★ 12¾" wide hardened steel ways of bed absorb heavy cutting force. ★ Infinite spindle speeds through trouble-free mechanical drive. ★ Push button controls for complete operation. ★ Neutral clutch stops spindle without stopping drive. ★ Three bearing mounts for spindle. ★ Collets mount directly in spindle. ★ Hand wheel for turning headstock spindle ★ Anti-friction bearings used throughout. ★ Gear box gives 72 feeds and 84 threads from 2 to 240 per inch. ★ Automatic lubrication. ★ Hardened and ground feed screws.



RIVETT 1020S is an Instrument Lathe and an Engine Lathe

A double-duty machine—combining the feather-touch sensitivity of an instrument lathe with that heavy-biting ruggedness which carbide cutting tools require. This powerful geared-head lathe qualifies for any turning within its 12½" swing and 20" centers.

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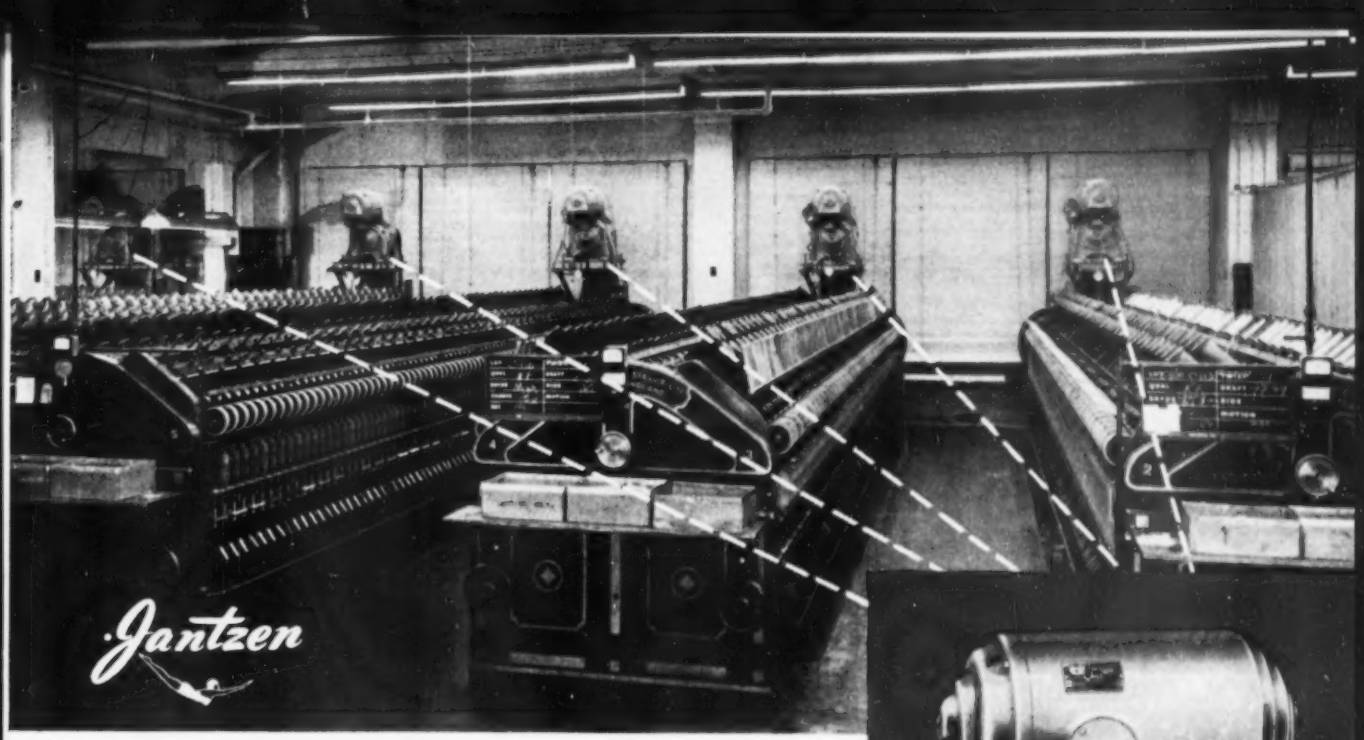
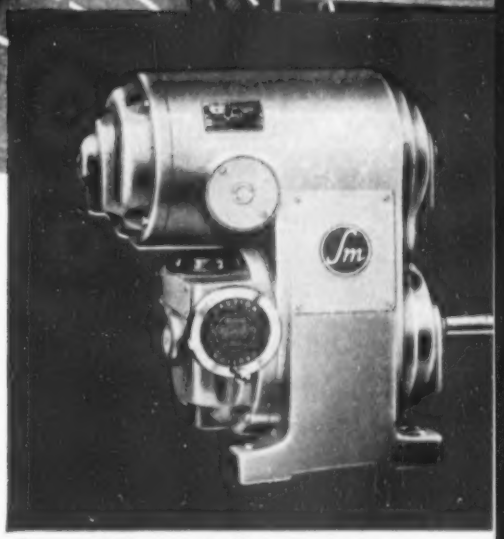
You can use other lathes . . . or employ other types of metalworking machines . . . but on no other lathe will you get so much production with such fine precision as on a Rivett.





JANTZEN INCREASES PRODUCTION 25% WITH STERLING SPEED-TROLS

We consider Speed-Trol Variable Speed Drives indispensable to the progress of the spinning industry, reports C. A. Fischer, Maintenance Engineer of Jantzen Knitting Mills, Inc. Since installing Speed-Trols on spinning frames and various other machines at Jantzen, production has increased 25% to 30% and maintenance costs have been reduced.

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In a nation-wide user survey of Sterling Speed-Trol Variable Speed Electric Power Drives:

86% Increased Production. **48%** Improved Product Quality. **64%** Reduced Production Costs. **42%** Modernized Equipment and Machines. **20%** Reduced Spoilage and Rejects. **28%** Increased Machine Versatility. **18%** Increased Plant Safety. **34%** Improved Employee Morale. **62%** Lowered Maintenance Costs. **46%** Saved Space. **18%** Simplified Operations. **16%** Synchronized Operations.

Investigate the possibilities of bringing some of these Speed-Trol production advantages to your plant. Sterling Engineering Sales Offices and over 400 Distributors and Service Shops throughout the nation effectively serve every industrial, commercial and agricultural area.

20-PAGE ILLUSTRATED CATALOG ... Sterling Speed-Trol, Slo-Speed, Klosd and Klosd-Tite Electric Power Drives. Write for catalog No. A-410.

There is a Sterling Electric Power Drive to Meet Virtually Every Requirement

Sterling Slo-Speed Electric Power Drives—for geared low speed at its best
Sterling Klosd and Klosd-Tite Motors—for constant normal speed at its best

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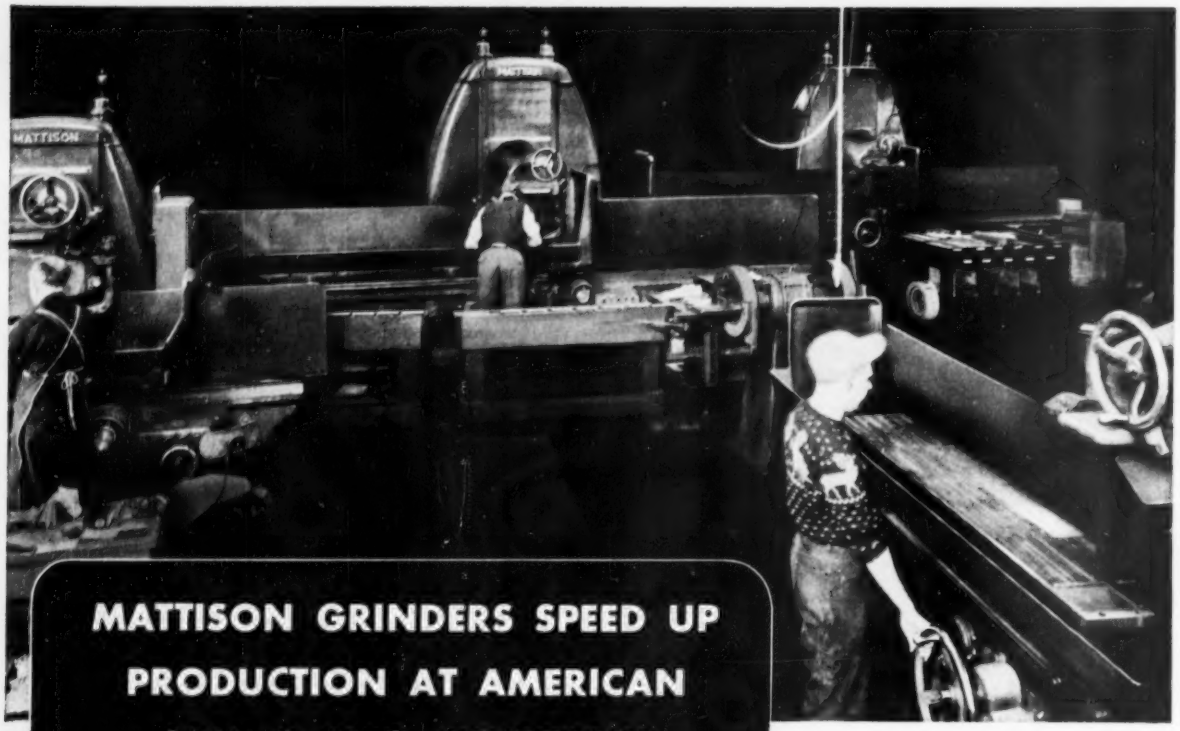
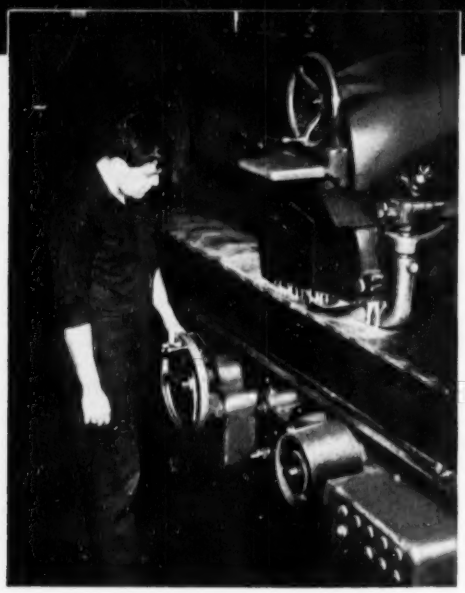


MATTISON GRINDERS SPEED UP PRODUCTION AT AMERICAN SAW & MFG. COMPANY



● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

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"We solve depth-of-hardness problems on low hardenability steels with GULF SUPER-QUENCH"

says James Mericka, President
Steel Improvement Co., Detroit, Mich.

"One of our current jobs is quenching and drawing 1¼ x 22 in. cold-rolled pins for tank tractor treads," says Mr. Mericka, "and we have to through-harden these pins to 35-40 Rockwell C. Ordinarily this is quite a problem with some of the substitute steels, such as AISI 8150 and 8160."

"But by using Gulf Super-Quench, we've been able to meet this hardness specification on every substitute steel delivered to us. And we get a minimum of distortion and cracking with this fast-quenching oil, which results in fewer rejects and an improved profit picture."

This is typical of the results obtained in scores of metal-working plants with Gulf Super-Quench. For additional information on this quality fast-quenching oil, call in a Gulf Sales Engineer. Write, wire, or phone your nearest Gulf office.

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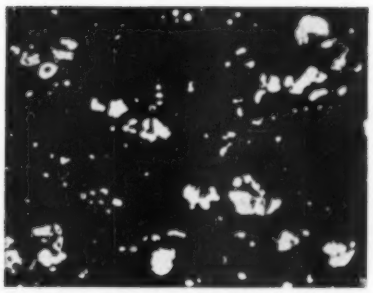
Ten Times More Necktie Clasps with Hobbed Molds of Duramold A



The white particles are extremely hard carbides which are distributed throughout this hardened structure of Lehigh H, enlarged 500 times in this micrograph.

These Two Carbide Steels for High Wear-Resistance

We're talking about Lehigh H and Lehigh S, two of our high-carbon, high-chromium grades of tool steel. Both are classed as carbide steels because they're intermediate between low-alloy tool steels and sintered carbides.

Lehigh H contains about 20 pct of carbide by volume, and Lehigh S about 30 pct. It's this high percentage of carbides that makes them wear and wear, even on severe jobs.

In actual service, the "soft" material (around Rockwell C-60) wears out between the carbides, leaving the carbides protruding just like individual stones in a cobblestone street. Lehigh H and S, with their abundance of hard carbides, far outwear lower-alloy tool steels.

Lehigh H is the most popular type of air-hardening tool steel where maximum production and freedom from distortion are essential. It's the general-purpose grade. Lehigh S has a higher carbon content to provide still greater wear, but at some sacrifice of shock-resistance.

Lehigh H is stocked in our mill depot in a wide range of sizes. It's also available from local stocks of Bethlehem tool steel distributors in principal cities.

Like to know more about these long-wearing die steels? Write us for Booklet 262. It gives details of both our oil- and air-hardening grades. Address your request to Publications Department, Room 1040, Bethlehem, Pa.

Here's another enthusiastic report on Duramold A, our 5 per cent chromium, air-hardening hobbing steel. Hobbed for zinc die castings, this special-purpose steel has upped the life of molds by at least 1000 pct, according to Peerless Engineering Co., Inc., South Gate, Calif. In the casting of novelty necktie clasps, the die sets of Duramold A were examined at a time when previous molds had to be discarded. The Duramold A cavities showed no evidence of checking or sinking; and the surface finish appeared to have actually improved with use.

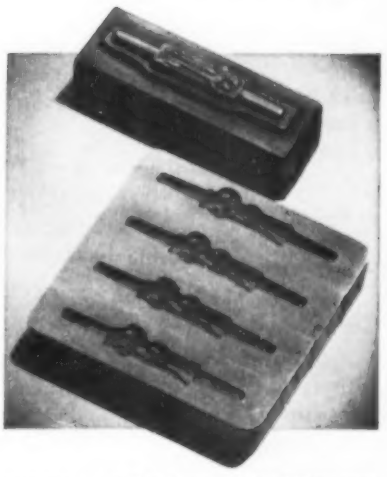
M. T. Derby, chief tool engineer for Peerless, sums it up:

"We like Duramold A because it's easy to hob. In making multiple cavities we get good detail and accuracy with fewer machine-hours. For most of our work we need a steel that gives us a high polish in the cavities with a high hardness that will stand up under zinc-injection molding at high pressures and temperatures. We've found Duramold A to have good core strength, it doesn't sink readily, and we can expect to get long runs with very little maintenance."

Whether used for die-casting or plastic-molding Duramold A is a real improvement over hard-to-hob steels. Its 5 pct chromium content provides plenty of wear-resistance and core strength . . . and its air-hardening properties hold distortion to a minimum during heat-treatment. Its typical analysis:

C	Mn	Si	Cr	Mo
0.97 max	0.40	0.20	4.50	0.45

Booklet 271 will help you select the right tool steel—for hobbed molds, machine-cut molds, or master hobs. Address your request to our Publications Department, Room 1041, Bethlehem, Pa.



Duramold A is hobbed in one push in a 300-ton press by the master hob shown at top. Eight necktie clasps are cast at one time, the molten zinc being injected at 800 F and 2000 psi; mold temperatures reach about 500 F.

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Here's why upset-forged discs are best for some tools

Like wood, steel has a grain. Tool steel discs which have been upset-forged have a grain-flow parallel to the disc face. When a disc is cut from bar stock, the grain flow is at right angles to the disc face. Before making tools from round discs, it's best to consider the importance of the direction of grain flow.

A milling cutter, for example, made from an upset-forged disc has a radial grain-flow in the cutting teeth. There's less chance of having these teeth break out than if the cutter were made from a disc cut from a bar.

Upset-forged discs are made by upsetting a piece of tool steel which is twice as thick as the desired thickness of the disc. This upset ratio of 2 to 1 should not be varied too greatly. A ratio of more than 3 to 1 will cause buckling during upsetting; less than 1.5 to 1 will not produce the desired flow lines of the grain.

NOW you can make Special and Production gages using your GAGE BLOCKS with new DoALL MICRO-STEP GAGING SYSTEM

HERE, for the first time is the means for directly applying gage blocks to thousands of precision measurement jobs which previously could be checked only with less accurate gaging setups.

—the means for securing micro-inch accuracy on *inside* as well as outside measurements.

—the means for assembling *gage-block* gages of every conceivable type, including gages up to 72" long.

—the means for making pin gages, snap gages, indicating gages, height gages, depth gages, go and no-go gages for use not only in the lab, but in the toolroom and shop as well.

Here, in short, is a practical, economical means of securing superior dimensional quality control, of reducing rejects and wasted time, material and money.

Key to the system are the new DoALL Gage Holders and gage block-accurate End Standards with full exposed measuring surfaces. No other gage system offers such a combination.

For complete details, call your local DoALL Sales-Service Store, or write:

THE DoALL COMPANY

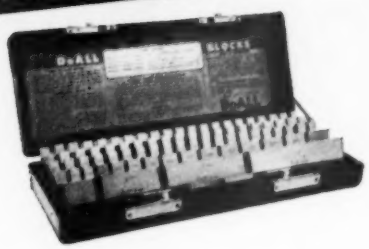
254 N. Laurel Ave., Des Plaines, Illinois

DoALL

ASK FOR NEW CATALOG

New Catalog describes the DoALL Micro-Step Gaging System in detail, lists all gage block, end standard and holder sets. Free on request.

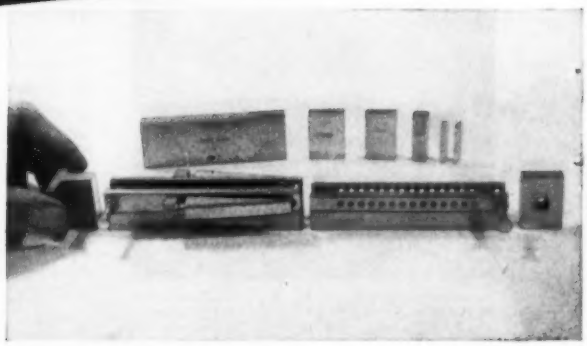
WITH THESE COMPONENTS . . .



DoALL BLOCKS

Accuracy second to none in the world. Most complete line of sets available, 6 to 118 pieces, including a new set having gage blocks up to 20.000" long.

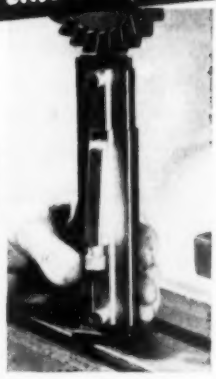
QUICKLY ASSEMBLED LIKE THIS . . .



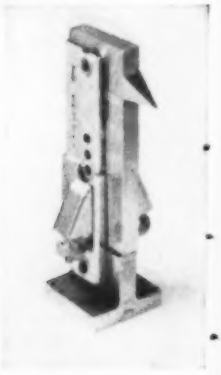
1. Select the holder, end standards and gage block combination for any gage you need.

YOU MAKE GAGES LIKE THESE . . .

Internal gage-block gage calibrating indicating snap gage.



Assembled height gage for checking milling cutter setting.



Height gage with scriber end standard for layout work.

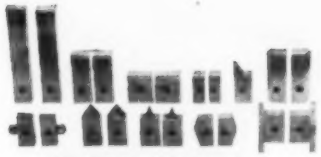
GB-13R

Menalite

Optical Flats

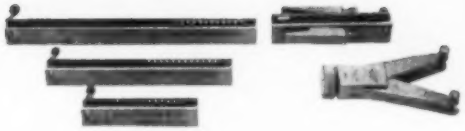
Vernier Gage Blocks

Sine Bars and Plates



NEW DoALL END STANDARDS

Here are gage block-accurate End Standards with fully exposed measuring surfaces which, when used with DoALL Gage Holders, make possible gage-block gages for every internal or external measuring job.

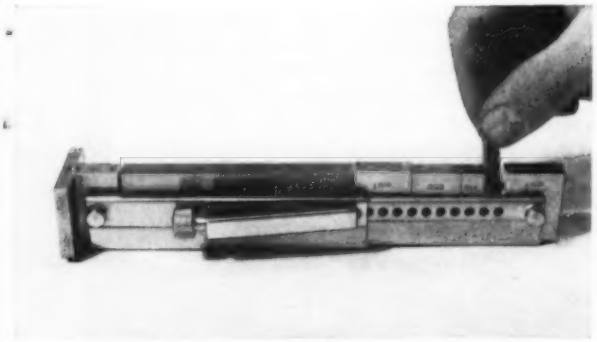


NEW DoALL GAGE HOLDERS

Channel-type holders available for making gages from 2" to 72" length. Quickly, easily assembled. Also a caliper holder for gages up to 6". For use only with DoALL End Standards and standard rectangular gage blocks.

NEW DoALL DIAL INDICATOR ASSEMBLIES

Here is the means of mounting dial indicators in any desired position in a DoALL Gage Holder to make indicating gages of all kinds.



2. Assemble holder, snap detent pins through end standards and insert correct gage block combination.

3. Press clamps into channel holes and tighten thumb screws snugly. That is all there is to it.

Internal indicating pin gage checking parts in the shop.

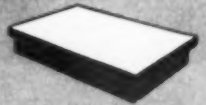
Pre-calibrated indicating comparator made with DoALL parts.

Micro-inch accurate indicating snap gage in use in the shop.

Go and no-go gage assembled with Micro-Step components.

This millionths-accurate indicating height gage is six feet long!

Electric Comparators



Granite Surface Plates

Mobile Inspection Unit

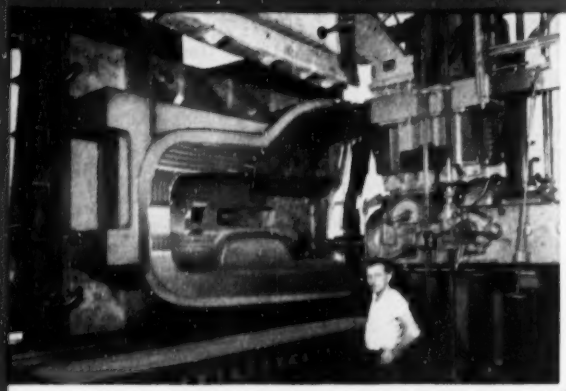
Gage Calibration Service

Gage Height Tables

Precision Measurement Text

Bring your standard machines up-to-date with

Turchan HYDRAULIC DUPLICATORS

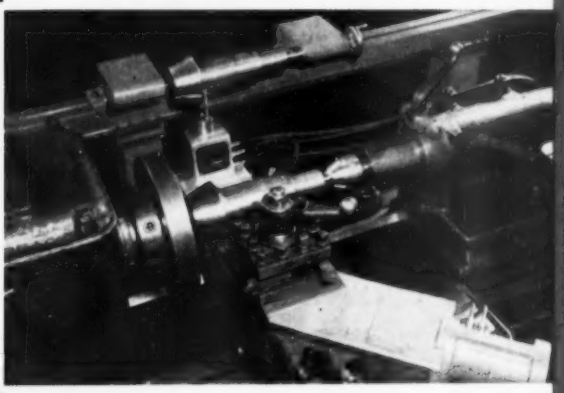


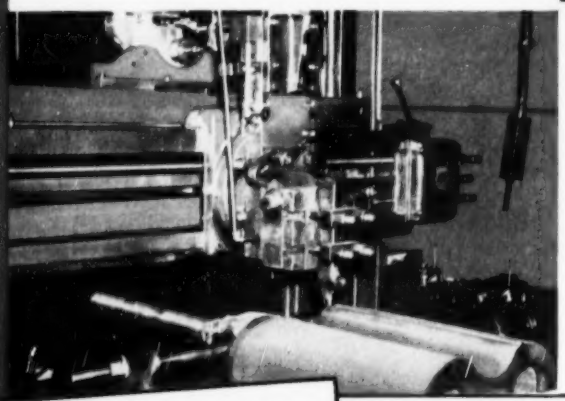
MILLING

The Turchan Follower attachment will transform those difficult tasks to simple push-button operation on your standard horizontal or vertical millers. Irregular profiles and contours; machining of dies, forms and moulds are achieved automatically. Hydraulically controlled cutting tools reproduce directly in metal, the exact dimensions of the model or template. No costly form tools or skilled help necessary. Close accuracies and extremely fine surface finish are cost-cutting features that save rejects. Turchan users report savings of 80% to 600% over old methods.

TURNING

Thousands of lathes in shops all over America, are increasing efficiency and speeding production with Turchan duplicators. The single attachment is pictured machining a stepped shaft. The Turchan replaces the regular cross slide; operates at 45° angle, taking uninterrupted cuts over the work. Square or tapered shoulders, radii, grooves, bevels and undercuts, as well as facing, are all taken in stride to accuracies of .001". There is also a Turchan *dual 45°* lathe attachment which actually doubles tool approach to the work. Any size or make of conventional lathe can be Turchan equipped.





PLANING

Standard planers equipped with the Turchan will duplicate irregular shapes, such as this blower section as readily as straight work. Contours are obtained automatically, with precision results. After job set-up, which is greatly simplified with the Turchan, little more than loading and unloading the work need be done. Once again skilled help is not required, yet production multiplies rapidly. Turchan Followers are also available for ordinary shapers and grinders. The attachment in no way interferes with the conventional controls of the machine tool. "Turn to Turchan to cut cost."

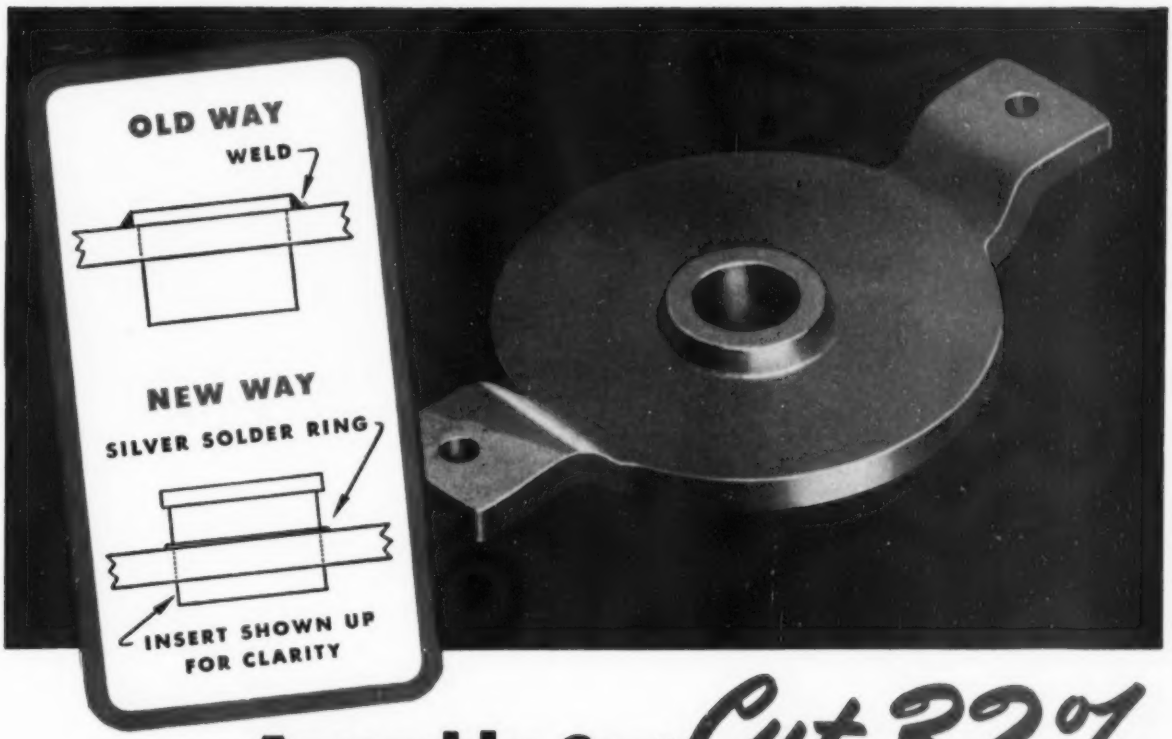
Write for New Catalog!

Tells how to get more and better work from your present machines, without skilled help and special tools.

GET AN ESTIMATE: Send a sketch and specifications of any job. Give make of machine. We'll show you how to produce it better, faster, at lower cost.

Turchan FOLLOWER MACHINE COMPANY

8259 LIVERNOIS AVENUE DETROIT 4, MICH.



Assembly Cost *Cut 32%* with TOCCO* Induction Brazing

Now's the time to balance YOUR production budget

This assembly may bear no resemblance to your product, but its case is typical of the savings accomplished by Induction Heating of metal parts of all sizes and shapes.

Formerly the Norris Thermador Corporation used arc welding to join the bushing and clamp shown above. In an effort to reduce costs TOCCO Induction Heating was brought into the production picture with the following results:

OLD METHOD (Arc Welding)		**NEW METHOD** (TOCCO Induction Brazing)	
Material (rod)	$ 4.56 per M parts	Material (solder and flux)	$13.83 per M parts
Labor	20.63 per M parts	Labor	8.82 per M parts
Overhead	21.25 per M parts	Overhead	9.08 per M parts
Total Cost Old Method	$46.44 per M parts	Total Cost TOCCO Method	$31.73 per M parts

TOCCO Engineers are glad to survey your operations for similar cost-cutting results — no obligation, of course.

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW **FREE** BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. B-1, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazing and Soldering."

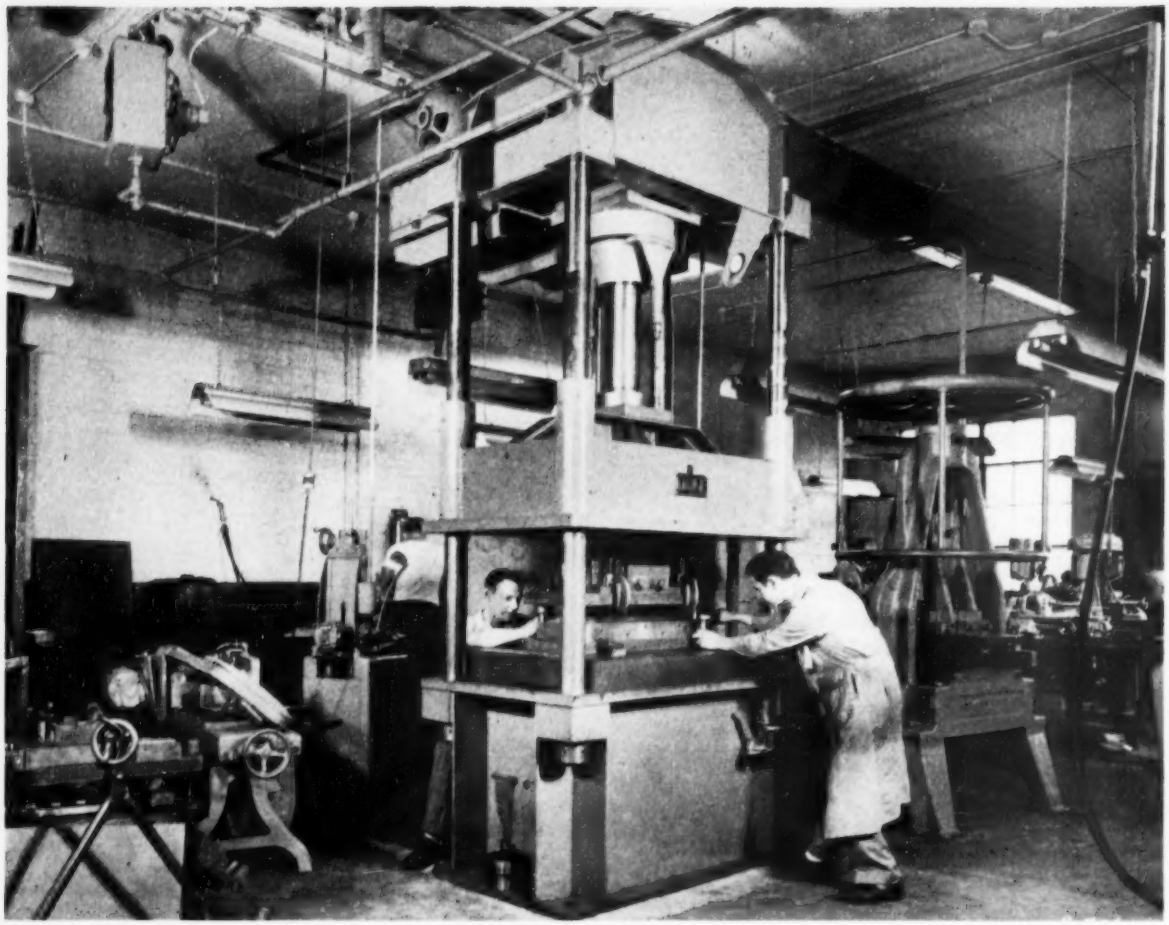
Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____



The diemaker who made a nuisance of himself

This is the story of Three Star Manufacturing Co.—a custom diemaker who serves a number of manufacturing plants in Chicago.

As in most such shops, his only means of trying out dies was a hand power screw press which sometimes needed six or seven men to get the needed pressure.

Large dies had to be tried out on his customers' production presses . . . which required drayage ($15 to $20 each way) and interruption of his customers' production. It meant both expense and nuisance to his customers and himself every time a die had to be tested.

Now he has ended the nuisance by installing the press shown above in his own shop. It not only saves time and money, but avoids the embarrassment of having workers in his customers' plants see and know that occasionally a die must be taken back for adjustment.

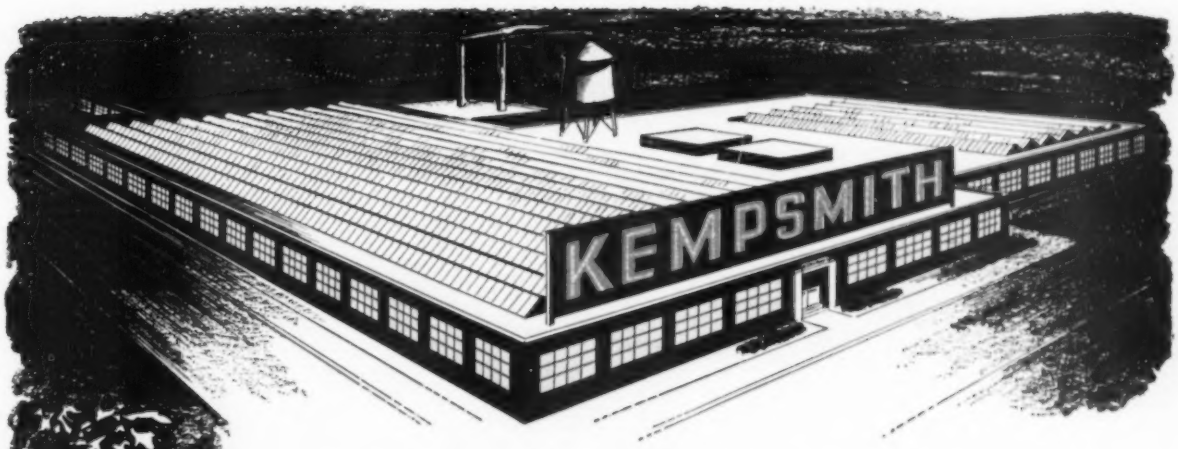
Specifications for single-acting and double-acting die tryout presses in ten air-operated and sixteen electrically operated models are contained in Bulletin 267—sent gladly on request.

Write for Bulletin 267

Dake Engine Company, 636 Seventh St., Grand Haven, Mich.

DAKE PRESSES

Arbor Presses · Hand-Operated Hydraulic · Power-Operated Hydraulic · Guided Platen · Gap Type Presses · Movable Frame



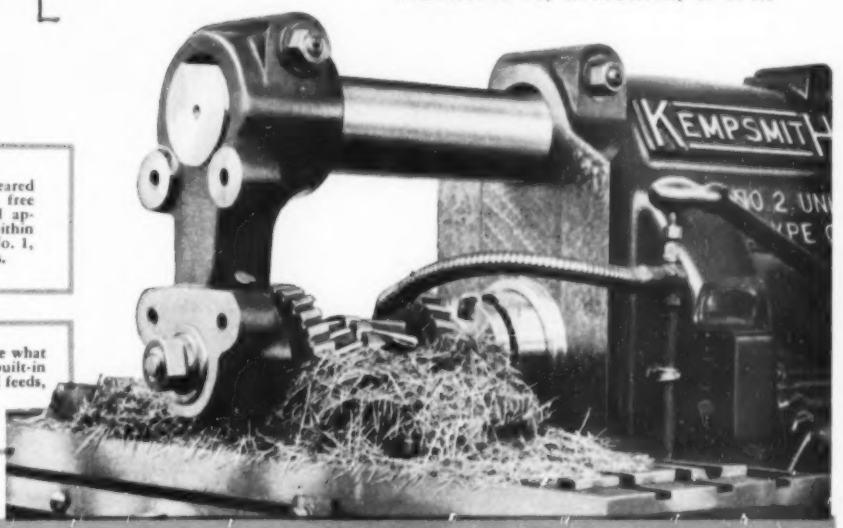
A Leadership Backed by More than 64 Years of Milling Machine History

Back in 1888, Kempsmith Engineers developed and produced the first Kempsmith Miller — a machine that was destined to achieve world-wide fame. The successful performance of this early model encouraged important engineering improvements and refinements resulting in much greater speed and precision in milling operations. Today, Kempsmith continues as a leader in the industry. The ruggedness, precision and ability to take heavy cuts smoothly make Kempsmith Milling Machines ideal for production, toolroom or general purpose milling. If you have a milling problem, consult Kempsmith. Our engineers will gladly give you the benefit of their broad experience in this specialized field.

THE KEMPSMITH MACHINE CO.
MILWAUKEE 14, WISCONSIN, U. S. A.

Kempsmith Type "G" Plain Miller. All geared for positive power and smooth cutting, free from chatter. Note rugged, streamlined appearance. All controls are grouped within easy reach of the operator. Available in No. 1, 2 and 3 sizes, plain and universal models.

Let the chips fly! Kempsmith Millers have what it takes for tough production battles — built-in ruggedness, increased range of speeds and feeds, greater power. Every machine is precision-built, the product of 64 years of milling machine experience.



KEMPSMITH

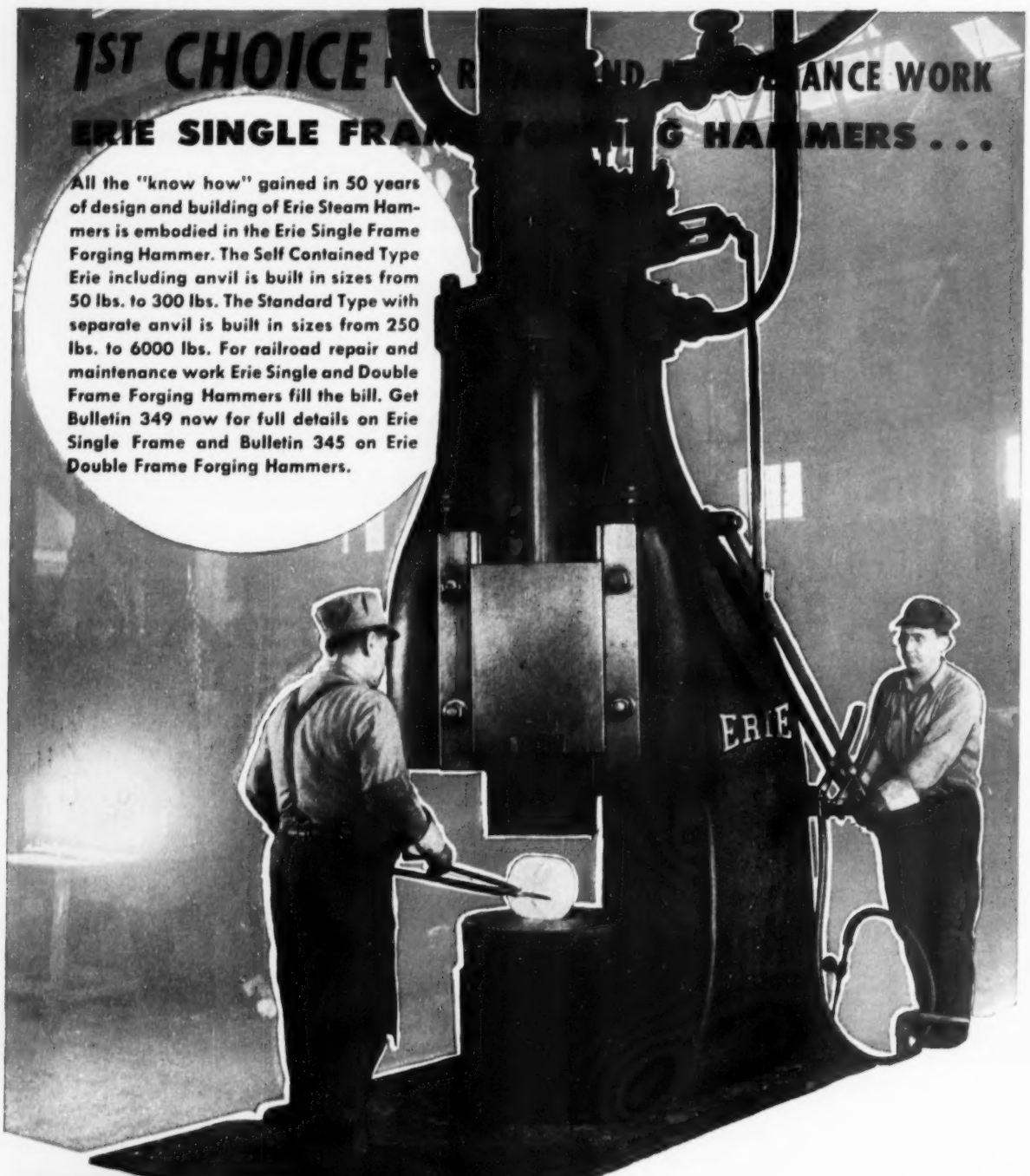
• Precision Built Milling Machines Since 1888 •

A-7270-1PC

1ST CHOICE FOR R[illegible]ND M[illegible]ANCE WORK

ERIE SINGLE FRA[illegible]G HA[illegible]MERS . . .

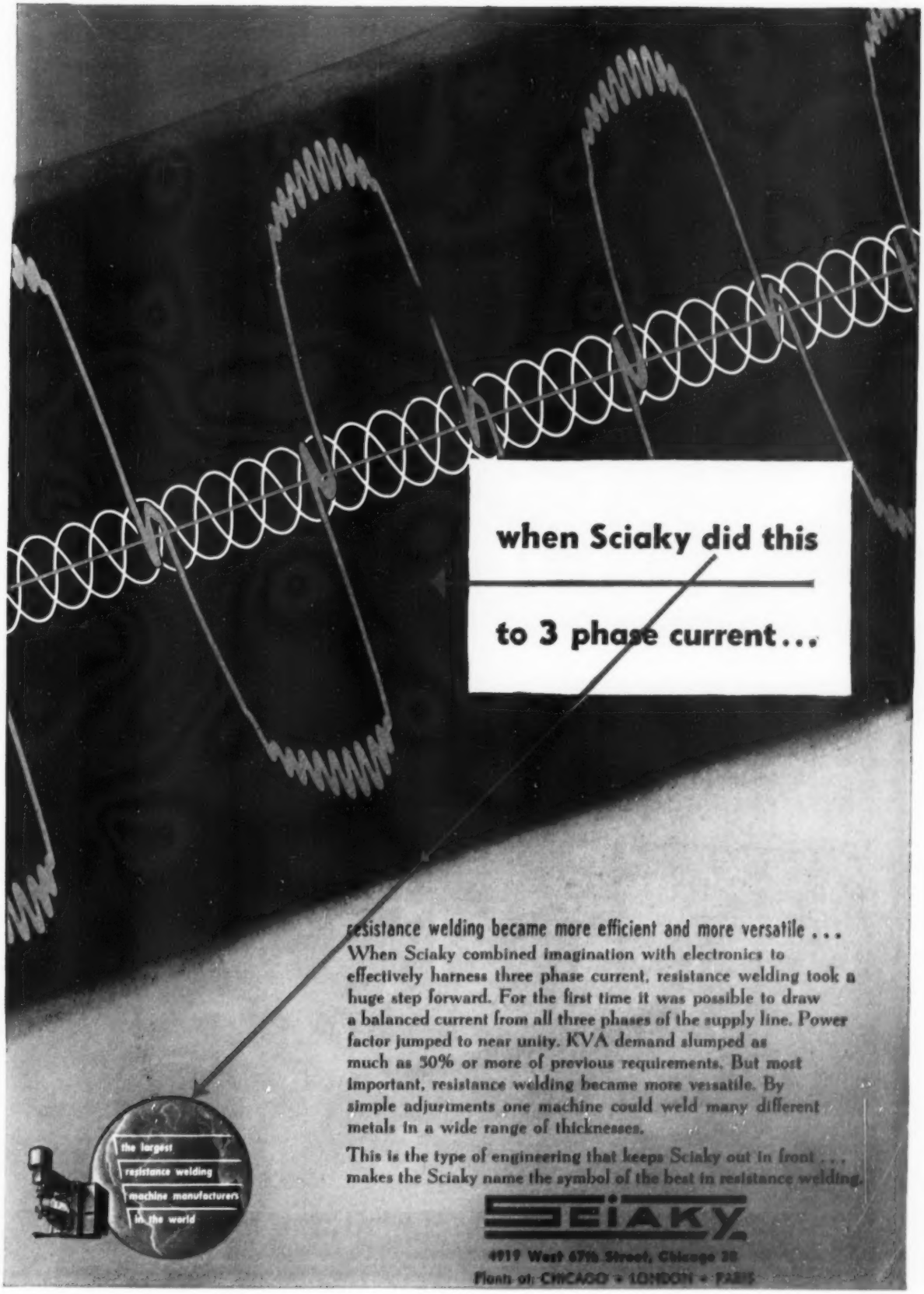
All the "know how" gained in 50 years of design and building of Erie Steam Hammers is embodied in the Erie Single Frame Forging Hammer. The Self Contained Type Erie including anvil is built in sizes from 50 lbs. to 300 lbs. The Standard Type with separate anvil is built in sizes from 250 lbs. to 6000 lbs. For railroad repair and maintenance work Erie Single and Double Frame Forging Hammers fill the bill. Get Bulletin 349 now for full details on Erie Single Frame and Bulletin 345 on Erie Double Frame Forging Hammers.



ERIE

ERIE FOUNDRY COMPANY
ERIE, PA. U. S. A.

ERIE BUILDS *Dependable* HAMMERS


when Sciaky did this
to 3 phase current...
resistance welding became more efficient and more versatile . . .
When Sciaky combined imagination with electronics to effectively harness three phase current, resistance welding took a huge step forward. For the first time it was possible to draw a balanced current from all three phases of the supply line. Power factor jumped to near unity. KVA demand slumped as much as 50% or more of previous requirements. But most important, resistance welding became more versatile. By simple adjustments one machine could weld many different metals in a wide range of thicknesses.
This is the type of engineering that keeps Sciaky out in front . . . makes the Sciaky name the symbol of the best in resistance welding.
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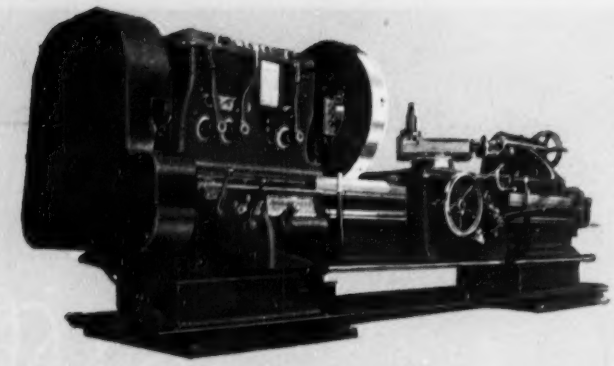
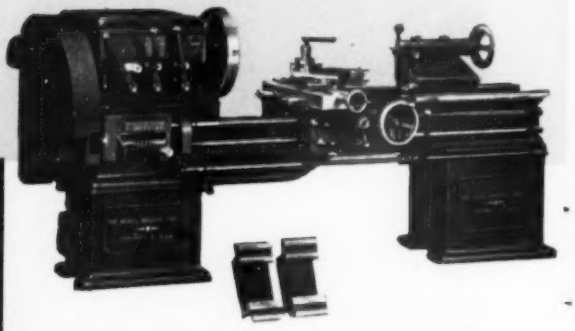


HEAVY DUTY ENGINE LATHES

Made in six swing sizes: 18", 20", 25", 27", 32", and 36".

REMOVABLE BLOCK GAP LATHES

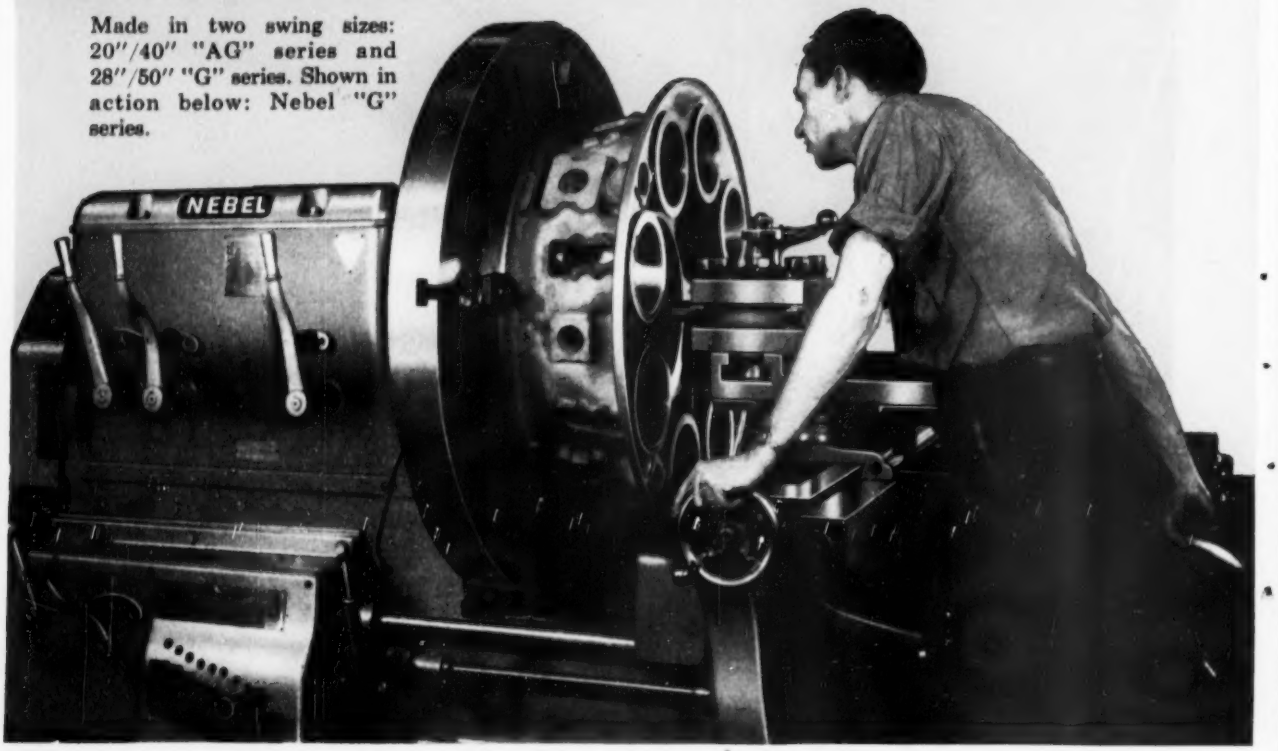
Three models: 18"/27" "LN" series, 20"/30" "AA" series and 25"/40" "D" series.

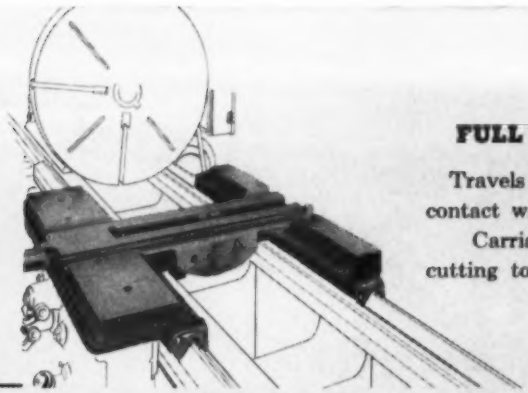


Nebel *engine, extension*

EXTENSION BED GAP LATHES

Made in two swing sizes: 20"/40" "AG" series and 28"/50" "G" series. Shown in action below: Nebel "G" series.

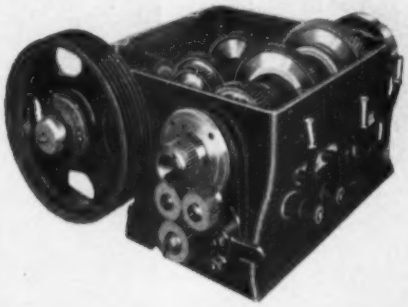




FULL BEARING CARRIAGE

Travels on 2 vee-ways . . . has 100% bearing contact with the bed throughout its 42"-length.

Carriage can thus take the thrust of the cutting tool without budging the slightest.



TIMKEN-EQUIPPED HEADSTOCK

The wide steel gears and short, heavy sleeves and shafts in Nebel headstocks deliver dependable power for heavy duty turning. The generous use of Timken anti-friction bearings reduces friction to a minimum. Helical drive gears deliver power smoothly, quietly.

Shaved and hardened gears available where required.

bed gap and removable block gap lathes

NEBEL LATHES BRING YOU ALL THESE ADVANTAGES:

- Powerful, smooth-running headstock, equipped with Timken anti-friction bearings.
- Full bearing carriage.
- Double wall apron.
- Heavy duty screw-operated tailstock.
- Heavy semi-steel bed (hardened ways available when required).
- Wide feed-thread selection from quick change gear box.

THE WORLD'S BEST MACHINE TOOL INVESTMENT:

Nebel Lathes! Why? Because they're so useful . . . for maintenance and for general metal-turning. And with the new hydraulic duplicating attachment and other Nebel accessories, they're ideal for *unlimited production!*

NEBEL LATHES ARE BASIC, ECONOMICAL, DURABLE.

They're husky, heavy duty lathes, built to give years of dependable, accurate, low-cost service. Made in swing sizes from 18" to 50", there's a Nebel lathe for every requirement. Write for complete information.

THE NEBEL MACHINE TOOL CO.,
CINCINNATI 25, OHIO, U. S. A.
THE WORKHORSE OF THE METAL WORKING SHOP SINCE 1899.

Nebel

"advanced control and speed range concepts which anticipate the future"

... was what ALLIS-CHALMERS asked for *and* got from NILES

Allis-Chalmers engineers wanted something special in machine tools. They wanted a 30-foot boring mill with "advanced control and speed range concepts which would anticipate the future . . . remain modern for decades."

Today, that Niles-built boring mill is hard at work in Milwaukee. A success? . . . just read what Allis-Chalmers has to say:

> "Niles Tool Works translated Allis-Chalmers' desires into a machine which has *fully met its high expectations.*
>
> In spite of the machine's vastly more complicated design, it is felt that its ruggedness and reliability will equal that of the 40-foot mill built by Niles in 1928, which has been in continuous operation at Allis-Chalmers for 23 years."

Results like this are typical of the experience of Niles users. So, if you need machine tools *with special features . . . with unusual versatility, strength and ruggedness . . . with long life*—come to Niles.

In the Niles standard line there are vertical boring mills to 43-feet, side-head mills to 54-inches, 6-inch horizontal mills, planers to 15-feet, lathes to 120-inches. Each is a brute force machine *with a precision touch.*

BALDWIN-LIMA

BALDWIN
BLH
LIMA-HAMILTON

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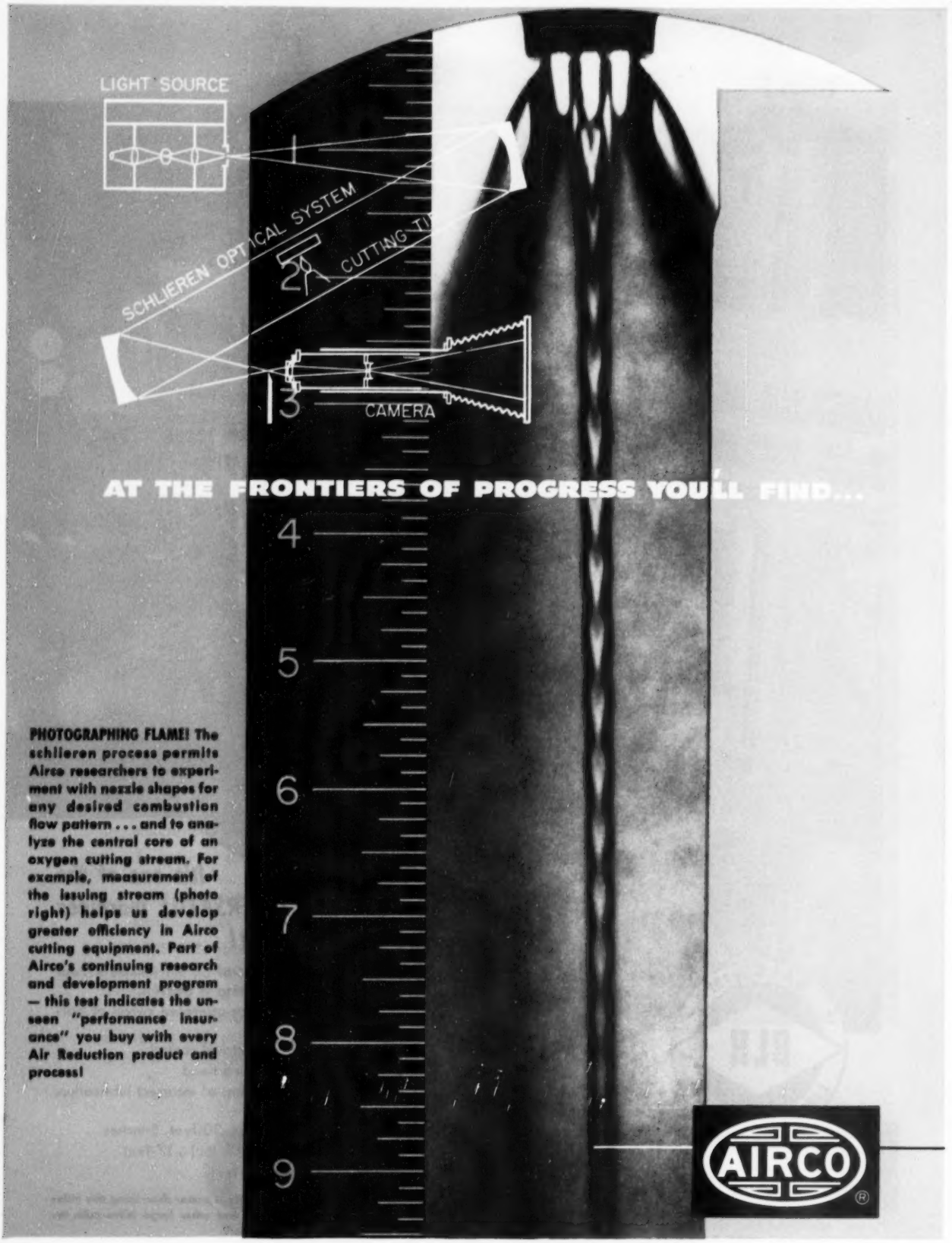
HAMILTON DIVISION • HAMILTON, OHIO

It's one of the
MOST VERSATILE machines ever built! . . . . . .

- Electrical control of all movements except where hand setting is desired.
- 45-degree motor-operated swivel of boring bars
- Four station electrical control
- Detachable milling head
- Automatic warning of incorrect lubrication, etc.
- Maximum swing—30-feet, 5-inches
- Max. height under tool—17-feet
- Bar travel—10-feet

Write for the technical paper describing this Niles 30-foot boring mill and other large Niles mills including the 43-foot mill.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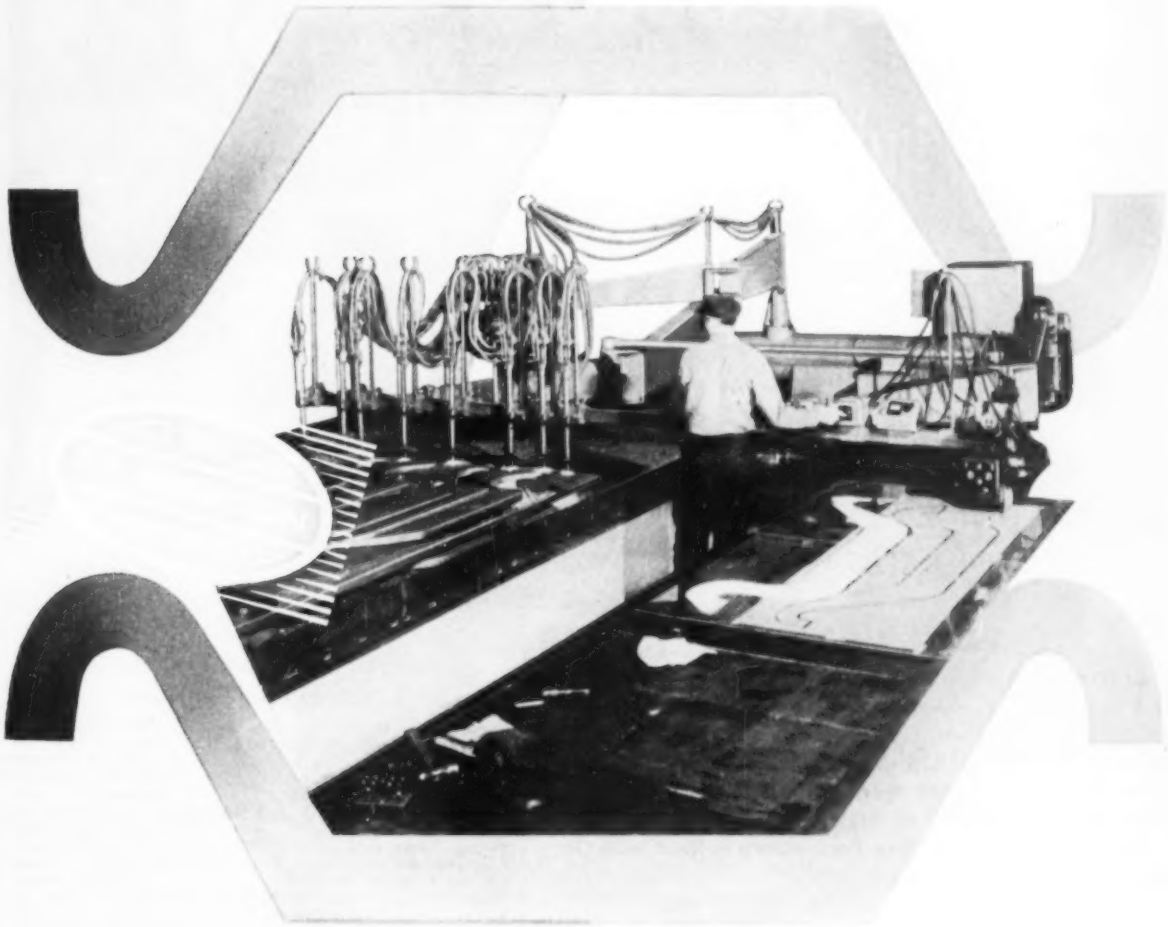
SCHLIEREN OPTICAL SYSTEM
CUTTING TIP
CAMERA
AT THE FRONTIERS OF PROGRESS YOU'LL FIND...
PHOTOGRAPHING FLAME! The schlieren process permits Airco researchers to experiment with nozzle shapes for any desired combustion flow pattern . . . and to analyze the central core of an oxygen cutting stream. For example, measurement of the issuing stream (photo right) helps us develop greater efficiency in Airco cutting equipment. Part of Airco's continuing research and development program — this test indicates the unseen "performance insurance" you buy with every Air Reduction product and process!
AIRCO

OXYGEN • ACETYLENE • INDUSTRIAL AND RARE GASES • CALCIUM CARBIDE • WELDING SUPPLIES AND ACCESSORIES

YOKES FOR AN IRON HORSE...



THE AIRCO NO. 50 TRAVOGRAPH mass produces yoke-shaped equalizer bars for locomotives . . . to a 1/16" tolerance! Torches are automatically guided by an electronic tracer following a low-cost, pen-and ink drawing . . . as four bars are cut simultaneously from 1½" mild steel, hot rolled plate. The versatile Travograph may be used for straight cutting, beveling or squaring . . . for circles up to 12 feet in diameter . . . or for straight lines of any desired length by adding extra sections of rail. Intricate shapes . . . cut to specification . . . with precision!

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Represented Internationally by Airco Company International
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• OXYACETYLENE WELDING AND CUTTING APPARATUS • ARC WELDING AND INERT-GAS ARC WELDING EQUIPMENT

BECAUSE the production and management team of the E. W. Bliss Company, Canton, Ohio learned from experience that Meehanite castings could regularly provide the reliable range of top quality properties demanded by their specifications, they operate two foundries which produce these castings for all major component parts.

The Bliss S-2 Heavy Duty Press shown is built with the following 10 major castings:

1. *Press Bed*
2. *Crown*
3. *Connections*
4. *Uprights*
5. *Slide*
6. *Bolster Plate*
7. *Bearing Caps*
8. *Flywheel*
9. *Gibs*
10. *Gears*

As can be seen from this list, the Bliss line, noted for its rugged dependability, precision manufacture, and trouble-free service makes maximum use of the uniform dependability of Meehanite castings—castings processed to provide the right combination of properties for the job.

Today as in the past, in modern designs the "TREND IS TOWARD MEEHANITE CASTINGS." Investigate the many ways they can improve your product—production—quality.

Write for our new sound slide film "Meehanite Castings Serve All Industry."

MEEHANITE®

NEW ROCHELLE, NEW YORK

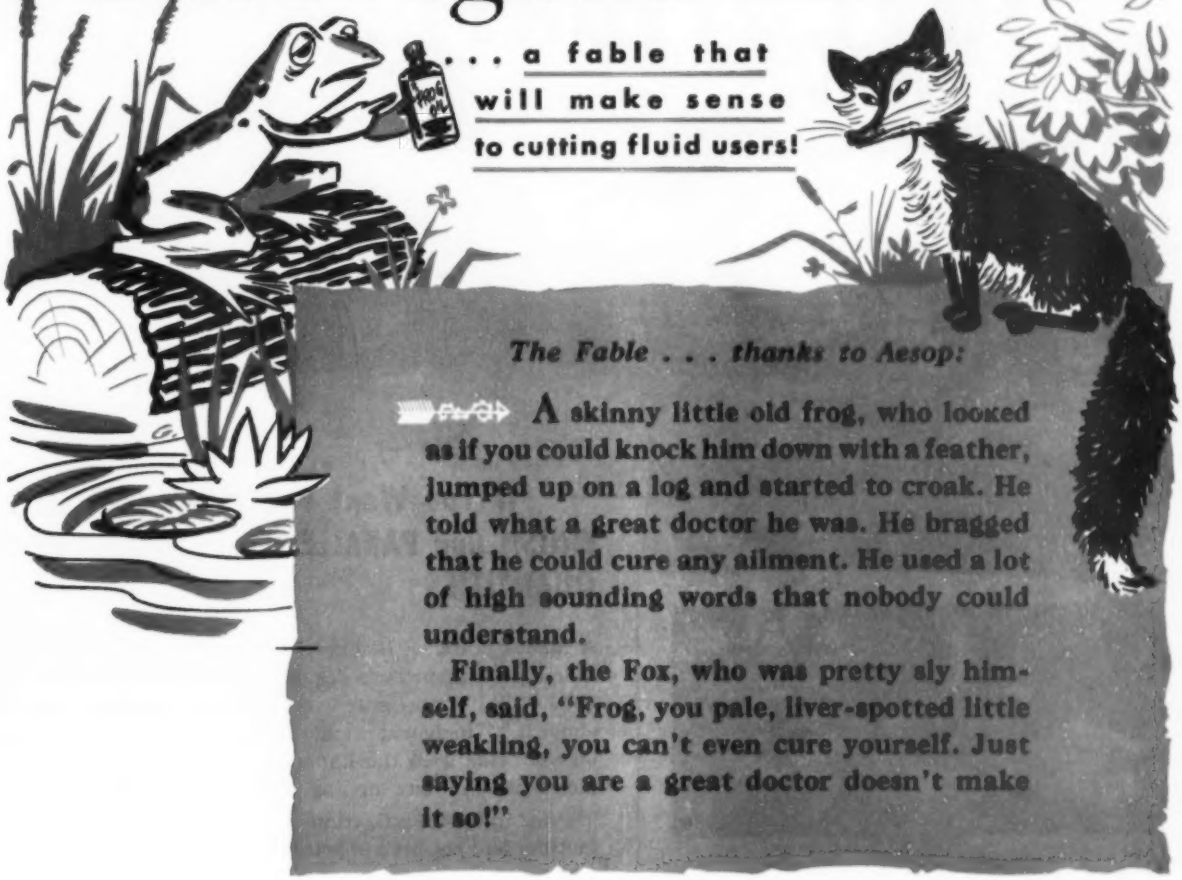
Take *YOUR* Casting Problem To A Meehanite Foundry

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington, New Jersey
E. W. Bliss Co.	Hastings, Mich. and Canton, O.
Builders Iron Foundry	Providence, Rhode Island
Compton Foundry	Compton, Calif.
Continental Gin Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
De Laval Steam Turbine Company	Trenton, New Jersey
Empire Pattern & Foundry Co.	Tulsa, Oklahoma
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Hardinge Company, Inc.	New York, New York
Hardinge Manufacturing Co.	York, Pennsylvania
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kanawha Manufacturing Co.	Charleston, West Virginia
Lincoln Foundry Corp.	Los Angeles, California
London Concrete Machinery Co., Ltd.	Brantford, Ontario
E. Long Ltd.	Orillia, Ontario
Otis Elevator Co., Ltd.	Hamilton, Ontario
Palmyra Foundry Co., Inc.	Palmyra, New Jersey
The Henry Perkins Co.	Bridgewater, Massachusetts
Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Sonith Industries, Inc.	Indianapolis, Ind.
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
Valley Iron Works, Inc.	St. Paul, Minnesota
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey

"This advertisement sponsored by foundries listed above."

"The Frog and The Fox"

. . . a fable that will make sense to cutting fluid users!



The Fable . . . thanks to Aesop:

A skinny little old frog, who looked as if you could knock him down with a feather, jumped up on a log and started to croak. He told what a great doctor he was. He bragged that he could cure any ailment. He used a lot of high sounding words that nobody could understand.

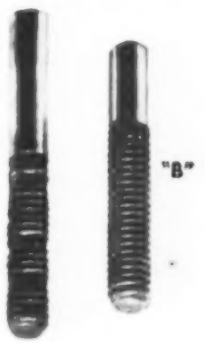
Finally, the Fox, who was pretty sly himself, said, "Frog, you pale, liver-spotted little weakling, you can't even cure yourself. Just saying you are a great doctor doesn't make it so!"

The Sense the Fable Makes:

You are often told that there are miracle-working cutting fluids that will cure all your problems in machining everything from brass to stainless. They often turn out to be like the phoney frog in the fable. Here is an example:

A Stuart Oil customer was using Stuart's SpeedKut B Cutting Oil on his Brown & Sharpe automatics for threading SAE 1020 material. He was induced to try a "do-everything" product on the job. Picture A shows what happened! Picture B shows the same job machined with Stuart's SpeedKut. The "frog oil" didn't have enough cutting value.

Ask to have a Stuart Representative show you how the correct cutting fluid for the job, correctly applied, can save you time, money and material. Use the handy coupon below.



"A" with "frog oil" — "B" with Stuart's SpeedKut B

More Than a "Coolant" is Needed

D.A. Stuart Oil Co.
EST. 1865 LIMITED

TIME-TESTED CUTTING FLUIDS AND LUBRICANTS

2729 S. Troy St., Chicago 23, Ill.

CLIP TO YOUR COMPANY LETTERHEAD AND MAIL

to D. A. Stuart Oil Co., Ltd., 2729 S. Troy St., Chicago 23, Ill.

Please ☐ Have Stuart Representative call

Check ☐ Send Booklet "Cutting Fluid Facts"

Your Name .....

Title .....

INVESTIGATE!

and use the LAPMASTER...

Above, parts lapped at high production on Lapmaster. Left, Model 12 Lapmaster in operation. Other machines available in complete range of sizes.

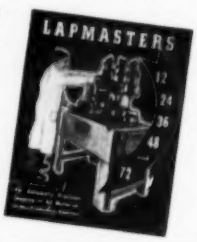
If You Want PRECISION FLATNESS, FINISH and PARALLELITY in PRODUCTION QUANTITIES

A manufacturer of hardened high carbon steel valves required parts lapped to a degree of flatness for withstanding 2000 P. S. I. air pressure with no leakage. The part shown above is $\frac{3}{8}$" in diameter and $\frac{1}{16}$" thick. It is precision lapped on each side with the Lapmaster 12" at the rate of 195 pieces per 5 minute lapping cycle per side.

Prior to his investigation of the Lapmaster, the manufacturer had not been able to find a satisfactory method of lapping these valve parts. He reported that he would have been unable to make this valve to its existing design without the Lapmaster. The economies of production it afforded made it possible for him to produce the valve at a marketable cost.

Use this FREE Laboratory Service to determine Your Exact Needs . . .

In order to determine whether lapping would be practical and profitable for you, we maintain a laboratory for lapping sample parts. If you believe it may offer possibilities in your plant we invite you to send prints of the parts, together with surface finish requirements and production desired. In addition send several parts for test lapping in our laboratories. We can then give you the facts on what you can expect from the Lapmaster. There is no obligation for this service.



ADDITIONAL DATA...

on the complete line of Lapmasters is available on request. Write for your copy today. Ask for bulletin AM-1.

Consistent Flatness of 1 Light Band Opens Possibilities for Product Improvement

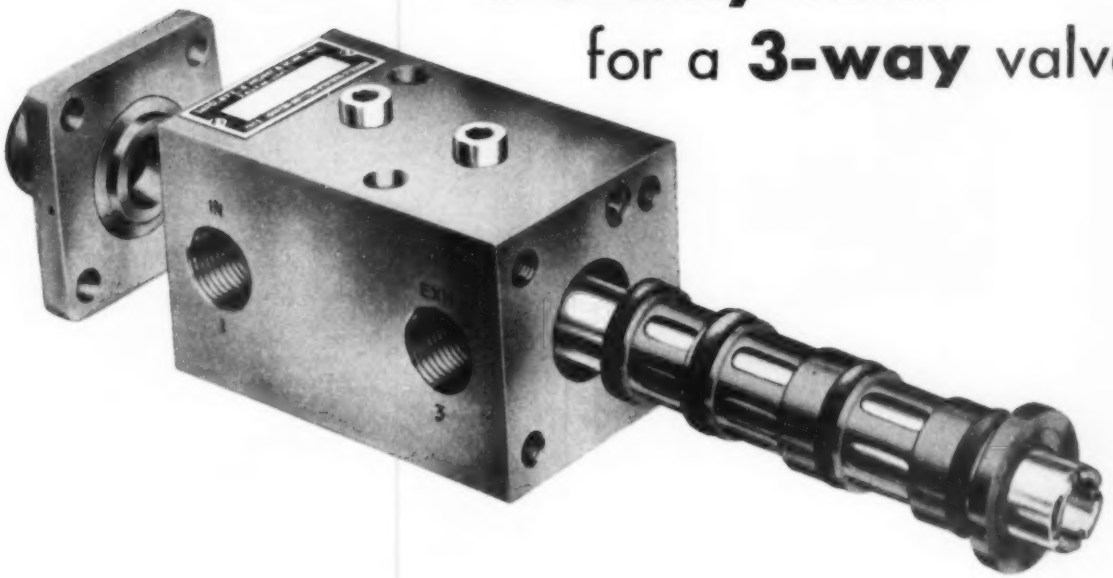
Manufacturers of pumps, compressors, and equipment containing liquids or air under high pressures have found it possible to eliminate gaskets in mating surfaces because of the extreme accuracy of work produced by the Lapmaster. Quality of surface (RMS) is controlled by Lapmaster compounds. Micro-inch finishes of 2 to 3 RMS are common. Surface flatness can also be held to less than one light band or .0000116". (11.6 millionths of an inch.)

JOHN CRANE

PACKINGS | MECHANICAL SEALS | TEFLON PRODUCTS | LAPMASTER LAPPING MACHINE | PIPE SEALING COMPOUNDS

CRANE PACKING COMPANY 1836 CUYLER AVENUE CHICAGO 13, ILLINOIS

a **3-way** metal for a **3-way** valve

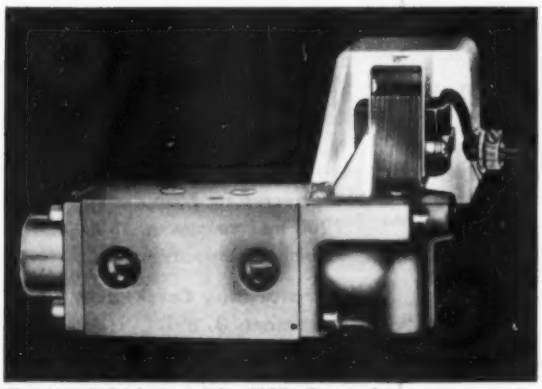


This is a "3-way" solenoid-pilot-operated control valve, made by C. B. Hunt & Son, Inc., used for operating large pneumatic and hydraulic industrial equipment. After thorough consideration by Hunt's engineering department, with an "assist" or two from The American Brass Company, ANACONDA Free Cutting Brass-271 was chosen for the 2½ in. x 2½ in. wrought bar stock used for the body. Here's what was required:

1. **ADEQUATE STRENGTH** — to withstand high operating pressures.
2. **EXCELLENT CORROSION RESISTANCE** — for smooth, uninterrupted service by air, oil or water.
3. **READY MACHINABILITY** — to economically perform a multitude of drilling, reaming, tapping and milling operations.

For the same reasons, ANACONDA Extruded Brass Rod of the same composition was used for the packing spacers, and ANACONDA Brass Die Pressed Forgings for the pilot caps.

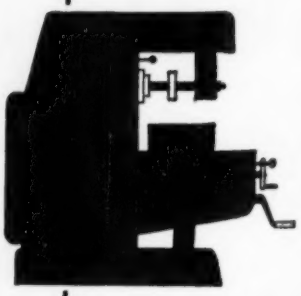
Maybe we can help you in matters of design or production where copper and copper alloys are concerned. Write The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario, Canada. 5296



This Type SA3 "3-Way" Solenoid-Pilot-Operated Valve for control of single acting cylinders is one of a complete line of "Quick-as-Wink" Control Valves made by C. B. Hunt & Son, Inc., Salem, Ohio. (When the solenoid is energized, the controlled single-acting piston moves to the extreme limit of its travel and remains there until the solenoid is de-energized, permitting the piston to return to its original position.) The design of the valve combines all the advantages of single-plunger construction with a new operating means for electrical control.

ANACONDA®
COPPER and BRASS

production begins with



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Contact Columbus Die-Tool & Machine Co. first—when you have a special machine problem. They are nationally known as expert designers and builders of special machinery and equipment . . . have been for over 46 years.

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JIGS • FIXTURES • BUILDING MACHINE TOOLS COMPLETE
SPECIAL TOOLS • UNITS FOR MACHINE TOOLS

the "label" tells you it's unique

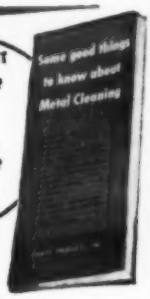
no other hydraulic pumps are like

See the Gerotor name-plate on a hydraulic pump and you know what's inside . . . the renowned Gerotor mechanism. Both elements revolve in the same direction at low relative speed . . . minimizing friction, wear and slippage . . . assuring longer life, smoother flow, higher efficiency at lower operating cost. Eleven pump sizes, some engineered for pressures up to 1200 p.s.i. continuous, 1500 p.s.i. intermittent. Specify Gerotor!

Gerotor May Corp., Box 86, Baltimore 3, Md.

GEROTOR
HYDRAULIC PUMPS

WHAT'S THE FASTEST WAY TO CLEAN METAL?
See page 11
WHAT'S THE MOST ECONOMICAL WAY?
See page 9



Oakite's FREE Booklet "Some good things to know about Metal Cleaning"

answers many questions that mean better production, more profit for you. Just look at the table of contents:

- Tank cleaning methods
- Machine cleaning methods
- Electrocleaning steel
- Electrocleaning nonferrous metals
- Pickling, deoxidizing, bright dipping
- Pre-paint treatment in machines, in tanks and by hand
- Paint-stripping
- Steam-detergent cleaning
- Barrel cleaning
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- Better cleaning in hard-water areas
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FREE For your copy of this 44-page illustrated booklet, use coupon below.

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OAKITE SPECIALIZED INDUSTRIAL CLEANING MATERIALS • METHODS • SERVICE

HAVE YOU TAKEN THE FOUR GOOD STEPS?
See page 5 ▶▶▶

This FREE Booklet Tells You How

In its 28 illustrated pages you'll find the answers to many questions that affect the success of your electroplating on steel. You'll want to read more about:

- ¶ Which costs more: good electrocleaning or poor electrocleaning? *See page 4.*
- ¶ How can cleaning costs be reduced 33⅓% while plating quality is being improved? *See pages 7 and 8.*
- ¶ What are four easy ways to improve the average rinse tank? *See page 10.*
- ¶ What rinsing fault is "an invitation to trouble" in the plating of high-carbon steel? *See page 11.*
- ¶ Why is it better to clean steel with reverse current than with direct current? *See pages 12 to 14.*
- ¶ What causes hydrogen embrittlement during electrocleaning? What is the remedy? *See pages 15 and 16.*

FREE For a copy of *"Four good steps toward better electroplating on steel"* use coupon below.

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WHAT'S THE BEST WAY TO STRIP PAINT FROM METAL PARTS TOO LARGE TO BE SOAKED IN TANKS?
See page 3

Oakite's FREE Booklet on Paint Stripping

answers many questions that will lead you to better stripping procedures. You'll want to read more about:

What's the best way to strip large areas of structural metal where a steam supply is available? *See page 5.*

What's best when steam is not available? *See page 7.*

What is the cheapest way to strip metal parts in large volume? *See page 9.*

What are the best ways to prepare stripped surfaces for repainting? *See page 11.*

What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

FREE For a copy of *"How to Strip Paint"* use coupon at right.

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THESE BOOKLETS HELP YOU SAVE MONEY

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24 Rector St., New York 6, N. Y.

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- ☐ Send me a FREE copy of *"Four good steps toward better electroplating on steel"*
- ☐ Send me a FREE copy of *"How to STRIP PAINT"*

ALSO tell me about Oakite methods for removing the following soils:

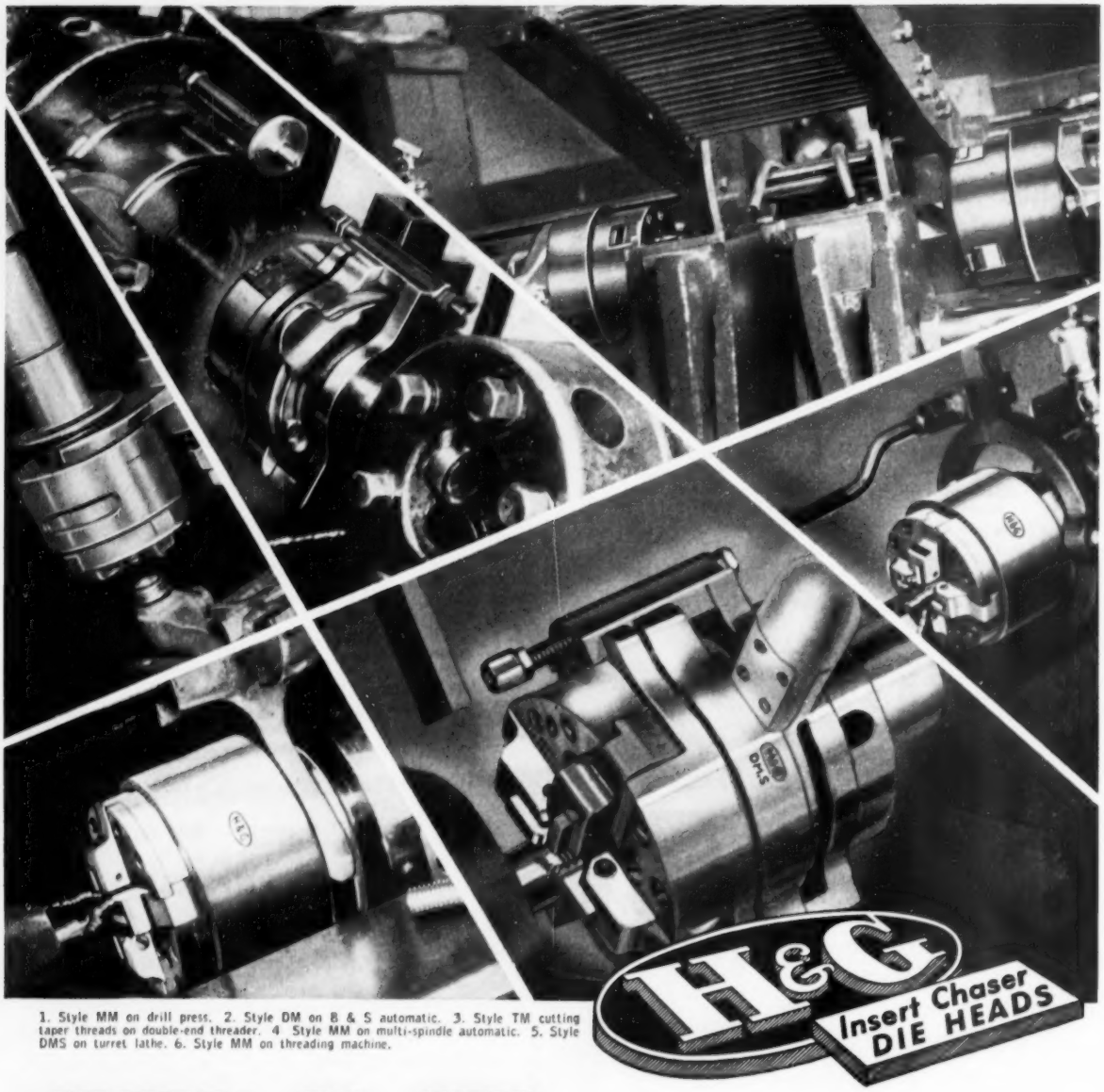
- ☐ buffing compound residues
- ☐ pigmented drawing compounds
- ☐ oils and greases
- ☐ rust, oxides ☐ heat scale ☐ flux residues
- ☐ carbon smuts ☐ tarnish ☐ rust preventives

other soils_____

NAME_____

COMPANY_____

ADDRESS_____



1. Style MM on drill press. 2. Style DM on B & S automatic. 3. Style TM cutting taper threads on double-end threader. 4 Style MM on multi-spindle automatic. 5. Style DMS on turret lathe. 6. Style MM on threading machine.

WHY IS IT? *In automatic screw machine departments . . . 4 out of 5 of the die heads on-the-job seem to be H & G*

You'll find other makes on the premises—tucked out of the way on the floor, on a nearby bench, on the foreman's desk, on the second shelf of the tool crib—

But, ***on the job, cutting threads,*** it is H & G.

Why this preference? What accounts for it?

It could be that producer of threaded parts find H & G more economical for threading by virtue of the low cost of insert chasers.

It could be that set-up men and operators have less trouble, less rejects, less downtime . . . with H & G Die Heads.

It could be the better class of threads . . . clean-cut, straight, true and accurate to micrometer dimensions, produced by H & G Die Heads.

It could be the interchangeability of H & G insert chasers, permitting jobs to be shifted from machine to machine, reducing the money tied up in inventory and the space required.

It could be the sum total of all these advantages that make the H & G Die Head—most wanted by operators working for efficiency; most wanted by management working for profits.

If you are not enjoying these benefits, maybe you can do something about it Write for Bulletin: How to Select the Proper Die Head for the Job, and mention make of machines operated.

THE EASTERN MACHINE SCREW CORPORATION • 20-40 Barclay Street, New Haven, Conn.

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Tool Room Grinders

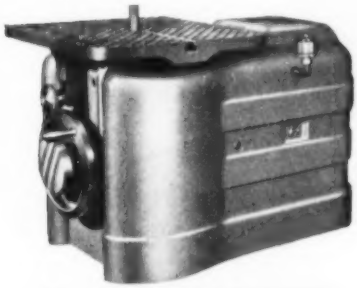
Boyar-Schultz Grinders for the tool room and die shop have won a most enviable reputation for accuracy where accuracy counts most. They are dependable . . . the favorite machine tools with skilled mechanics who KNOW how a fine tool must perform.

These tool room grinders have the design, the fine quality materials, and the unexcelled workmanship that make them the best your tool dollar can buy.

No. 6-12 SURFACE GRINDER

A precision Machine Tool built to provide the close tolerance performance that has long been associated only with larger and more costly grinders. Users tell us that it produces flatness, horizontal and vertical tolerance comparable with any other grinder regardless of size.

The new Boyar-Schultz Dust Collector Unit is furnished as optional Equipment. It is built into a new streamlined stand which replaces the stand furnished as regular equipment. No additional floor space is required with Dust Collector Unit.



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A fast operating precision Machine Tool for saving time in grinding odd and irregularly shaped surfaces; fitting dies and punches and other time consuming grinding jobs.

No. 2 PROFILE GRINDER

A Profile Grinder for larger and heavier work. Made in two styles—Single or Dual Spindle. Designed for such heavy work as aircraft, automotive and locomotive building, and other heavy profile grinding.

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An extremely accurate Grinder for tool room work and gage grinding, as well as production. Rugged construction and superior engineering assure accuracy over a long period of usefulness.

Write for Circulars

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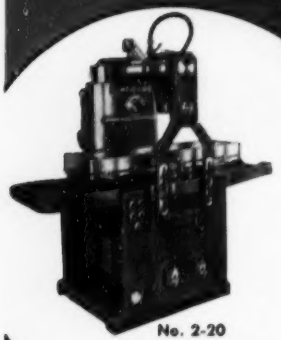
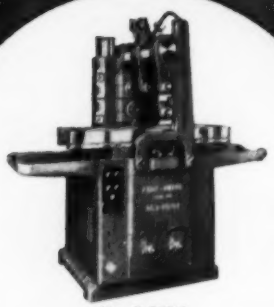
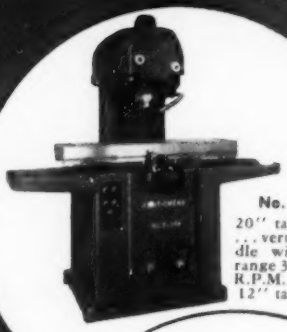


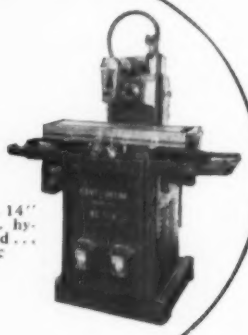
No. 2-20
20" table travel . . . 42" x 12" table . . . full automatic hydraulic table feed.



No. 2-20DS
Double Spindle for two milling operations at same time . . . 20" table travel . . . 42" x 12" table.



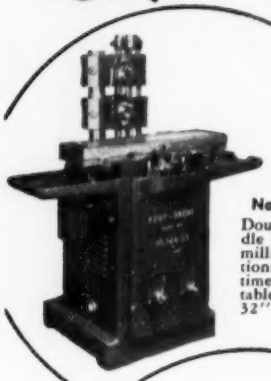
No. 2-20V
20" table travel . . . vertical spindle with speed range 32 to 1284 R.P.M. . . . 42" x 12" table.



No. 1-14
32" x 9" table . . . 14" table travel . . . hydraulic table feed . . . full automatic cycle.

Speed up YOUR MILLING!

Get top-speed milling with high accuracy . . . put the work on Kent-Owens Machines! They're outstandingly rugged . . . efficient . . . dependable. Designed with twin-post head mounting that assures balanced load—no chattering. Practical features throughout to help you *produce more . . . save labor . . . reduce costs!* Write for bulletins on wide range of hydraulic and hand-operated machines. Kent-Owens Machine Co., Toledo, Ohio.



No. 1-14DS
Double Spindle for two milling operations at same time . . . 14" table travel . . . 32" x 9" table.

KENT-OWENS REPRESENTATIVES

BOSTON
General Machinery Corp.

BUFFALO
Elton W. Patterson

CHICAGO
Four States Mach'y Company

DALLAS
Hunter Machine Tool Co.

DAYTON
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Oliver H. Van Horn Co., Inc.

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Burke & Gerwan Mach'y Co.

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Four States Mach'y Company

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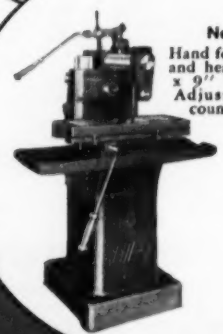
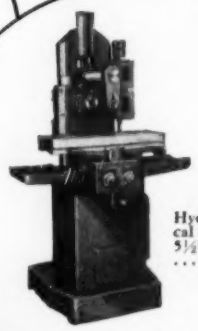
KENT-OWENS

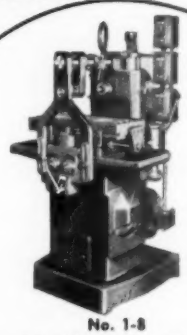
Milling Machines



No. 1-M
Hand feed to table and head . . . 25" x 9" table . . . Adjustable head-counter-balance.



No. 1-V
Hydraulic vertical head feed . . . 5½" head travel . . . 25" x 9" table.



No. 1-8
8" table travel . . . 25" x 9" table . . . automatic hydraulic table feed.

Mechanically Mounted

KLAMP-LOK TOOLS

with vertically clamped Talide Inserts

SPECIAL ADVANTAGES

MAXIMUM SUPPORT given insert by clamping in direction of cutting force—**OPEN FACING** of insert prevents chip erosion of toolholder.

QUICK ADJUSTMENT from either top or bottom gives flexibility in clamping, removing or adjusting insert.

TRIGGER ACTION spring clamp assures fast, easy insert removal — and trouble free servicing of toolholder.

● KLAMP-LOK tools are rugged, rigid and extra strong—and are proving their superiority in hundreds of plants all over the country.

Multiple-sided cutting edges of the TALIDE insert, turned end for end, give exceptionally long service life between grinds—and can be reground without removing toolholder from the machine setup. Equally adaptable for either conventional or inverted type of mounting, the KLAMP-LOK toolholder cuts costs on all types of tough, high-speed production jobs.

Solid TALIDE inserts are stocked in 9 standard sizes and 4 standard grades. KLAMP-LOK toolholders are available in 10 standard styles and 70 standard sizes.

Write or wire today for circular No. KL-52, or ask your nearest TALIDE service engineer for a personal demonstration. **Metal Carbides Corporation, Youngstown 7, Ohio.**

HOW TO ORDER

You can order direct (24-hour service) from warehouses in Newark, Youngstown, Detroit or Chicago. Place order, too, for Talide Tools and Tips.

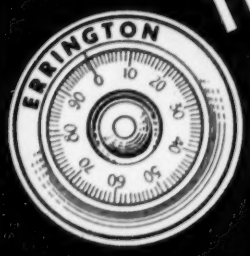
METAL CARBIDES CORPORATION

TALIDE

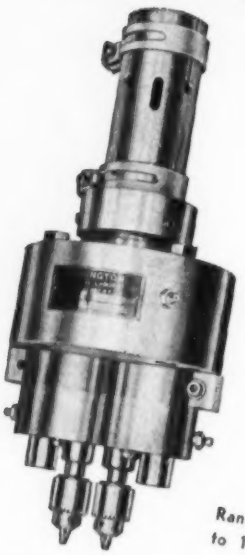
YOUNGSTOWN 7, OHIO

SINTERED CARBIDES · HOT PRESSED CARBIDES
TUNGSTEN ALLOY HEAVY-METAL
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

THE RIGHT COMBINATION TO CUT DRILLING AND TAPPING COSTS

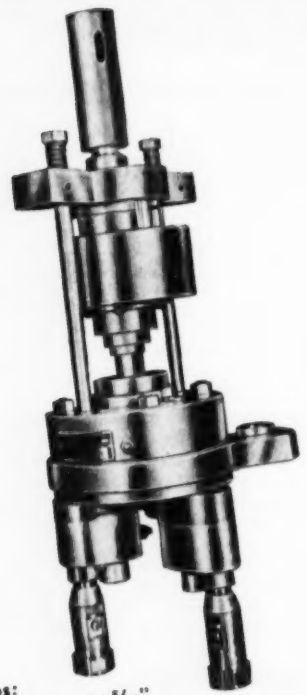


ERRINGTON *Adjustable* DRILLING HEAD



Range from 0 to 1½" drills

ERRINGTON *Adjustable* TAPPING HEAD



Sizes:
#0-#10 Tap to 5/16"
#1-3/16" Tap to ½"

Write for Complete Information

Here are versatile tools which permit you to take advantage of a wide range of adjustment—without overhang. Supplied with 3 spindles for equal adjustment in line and 3, 4, 5 or 6 spindles for equal adjustment on bolt circles.

Features: Fully geared. Needle bearings on all spindles in head. Ball thrust bearings throughout. Bronze bushed. Sand cast aluminum case. All parts fully enclosed for pressure lubrication and protection. Non-slip positive clamping on all adjusting members.

ERRINGTON MECHANICAL LABORATORY, Inc.
Established 1891
Main Office and Plant: **STATEN ISLAND 4, NEW YORK**

Typical of hundreds of applications

where SuVeneer® clad metals

are being used successfully today

Wherever the advantages of solid copper or brass *surfaces* are required, product designers and manufacturers are finding *new economy* and complete adaptability in **SuVeneer** Clad Metals . . . *solid* copper or brass, bonded inseparably to one or both sides of plain strip steel. **SuVeneer** Clad Metals are furnished in easy-handling coils—in the gauges and widths you need. Write for descriptive Bulletin.

Superior Steel
CORPORATION
CARNEGIE PENNSYLVANIA

YOU TELL US... what you need in IMPACT

- sockets
- extensions
- adapters
- universal wrenches

90% of all nutrunning problems can be solved efficiently and economically by using one or more of the thousands of stock types and sizes of Apex sockets, extensions, adapters and universal wrenches.

And, if your operations come under the special 10%, you'll still find the answer at Apex. For Apex will build tools to meet your specific nutrunning requirements.

If you're plagued by tool breakage or quick wear-out, you don't have to compromise on tools that merely come close to your requirements—Apex will build tools to match your requirements exactly.

We'd suggest you look through Catalog 29 first (just drop a line on your company letterhead for your copy). If you don't find the solution to your nutrunning problem there, then send us a sketch or blueprint outlining your particular problem. We'll quote promptly, without any obligation to you.

APEX TOOLS

sockets, extensions, adapters

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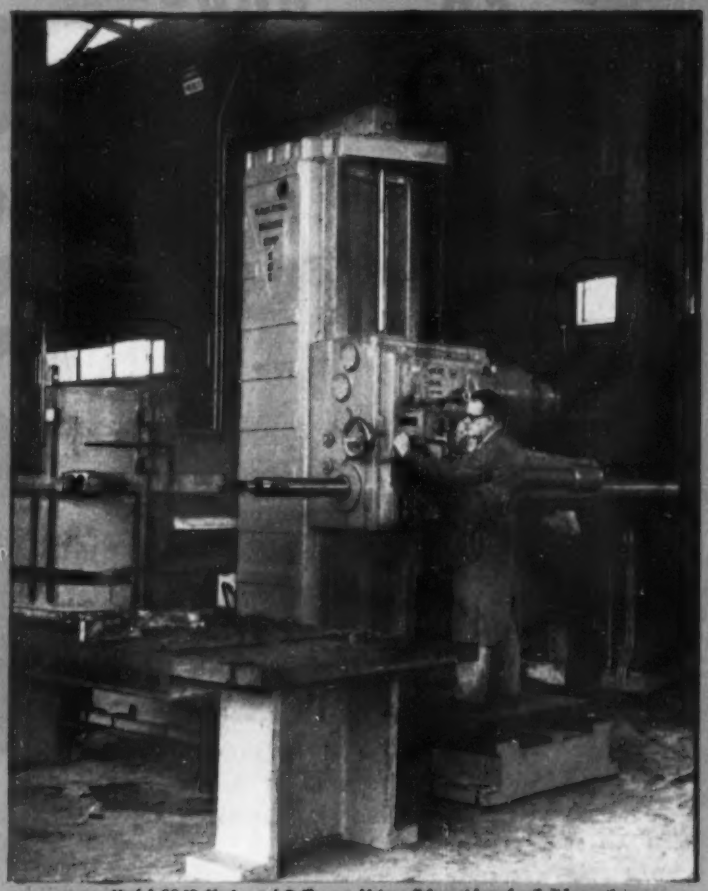
POWER BITS, INSERT BITS AND BIT HOLDERS, FOR PHILLIPS, FREARSON (Reed & Prince), SLOTTED, CLUTCH HEAD and SOCKET HEAD SCREWS • HAND DRIVERS FOR PHILLIPS, FREARSON AND CLUTCH HEAD SCREWS • TWO-PIECE DRIVERS FOR HEX HEAD SCREWS • SOCKETS, EXTENSIONS, ADAPTERS AND NUT SETTERS • UNIVERSAL SOCKETS, EXTENSION WRENCHES AND ADAPTERS • AIRCRAFT AND INDUSTRIAL UNIVERSAL JOINTS • SELF-RELEASING AND ADJUSTABLE STUD SETTERS • SAFETY FRICTION TAPPING CHUCKS • VERTICAL FLOAT TAPPING CHUCKS.

Kaukauna UNIVERSAL AND HORIZONTAL DRILLING AND TAPPING Machines



Model 3040 Horizontal Drill—machining all four sides of rail side casting.

CUT COSTS ON SETUP TIME, CRANE TIME, FIXTURING MACHINE HOURS

. . . drive boring fixtures and perform drilling, reaming, boring, counterboring, tapping and spotfacing operations on any size or shape from small production parts to large unwieldy workpieces.

Model 3040 is a sturdy rugged horizontal drilling machine with 10 HP, 15HP or 20HP spindle motor and unusual column rigidity. Maximum productivity assured by use of highest feeds and speeds permissible with modern cutting tools.

Other horizontal models have tilting head or horizontal head and 360° column swivel. Universal models with compound head swivel permit angular, radial and horizontal machining operations with one setup. Machines designed for both portable and stationary applications. Extended runway travel and column height available on all models. Special adaptations to handle your machining problems.

WRITE FOR CATALOG

Model 125-U Universal Drill—drilling, tapping and dowelling rocks in place on boring machine runway.

Model 125-HR Horizontal Drill—used with revolving table to drill and tap tractor frames.

Model 1030 Horizontal Drill—performing drilling, tapping and boring operations on milling machine column.

Special Model 140-U with extended column, runway, and reach—for drilling Diesel Engine bases and blocks.

KMC

Kaukauna MACHINE CORPORATION

KAUKAUNA, WISCONSIN, U. S. A.

Solve... TOUGH CONTROL and DRIVE PROBLEMS with IR AIR MOTORS

Here is a typical problem. . . . Ingersoll-Rand Air Motors solved this tough control problem in a paper mill. Since steam and acid conditions prevailed, manual operation of digester dump valves was extremely dangerous. These conditions also prevented satisfactory use of electric motors and controls. Size 55SM Air Motors were installed, dumping was controlled from the charging floor 50 feet above the dump valves, and stand-by valve crews were no longer necessary, due to the reliable, trouble-free operation of the Ingersoll-Rand Air Motors.

When wide ranges of operating speeds are desired . . . when instantaneous starting and stopping is needed . . . when the motor will be subjected to frequent stalling and overloads . . . when wet, acid, or explosive atmospheres, or high temperatures make operations too hazardous for direct manual control . . . when expensive and complicated protection devices would otherwise be required . . . when compact motor units are essential . . . and finally, when installation and maintenance costs must be kept low . . . the Ingersoll-Rand Air Motor is the answer to the problem.

Write, wire, or phone your nearest Ingersoll-Rand branch office for help with your tough control and drive problems . . . or request the new Air Motor Bulletin, Form 5072, which gives full information on over 110 sizes of Air Motors . . . both Piston and Multi-Vane types . . . speeds from 5400 to 19 r.p.m. . . . from 1 to 24 H.P. . . . or request information on fractional horsepower Air Motors.

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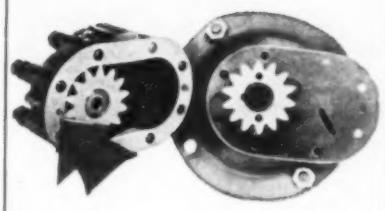
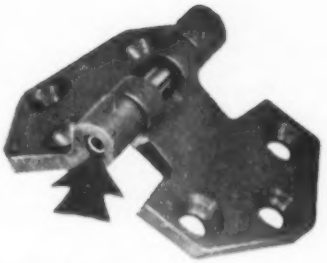
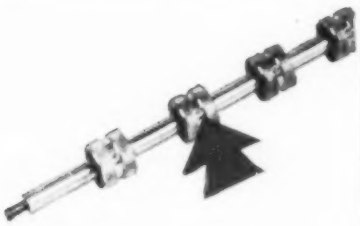
REPLACING A HUB ON A GEAR . . . Rollpin, self-retained in shaft, is simply snapped into molded slot to position sintered gear. This application, by Ditto Inc., effects major savings in assembly. Rollpin's high shear strength is particularly valuable here.



REPLACING A MACHINED PIN . . . In the lubrication pump assembly of the Cummins HR-400 diesel engine, two Rollpins are used as positioning dowels. Rollpins are self-retaining in production-drilled holes . . . quick to assemble and easy to remove.

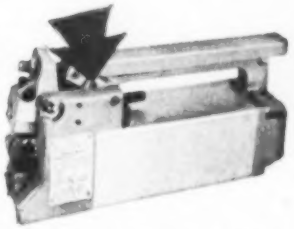


REPLACING A HEADED PIN . . . In this hinge pin application, Rollpin is simply and inexpensively driven in place, greatly reducing assembly costs. Constant spring tension holds Rollpin firmly in place . . . eliminates loosening of hinge due to wear.



REPLACING A SET SCREW . . . Paper feed rollers are quickly, economically pinned to shaft by Rollpins in this office machine made by Ditto Inc. Flush fit affords neat appearance . . . spring tension assures positive, permanent positioning of rollers.

REPLACING A RIVET . . . Rollpin serves as guide shaft for spring-loaded electrical interlock contacts. The Square D Company reports that rivet failure previously occurred at the clinched end under normal operating impact and vibration.



REPLACING A BOLT AND NUT . . . Rollpins act as fasteners and pivots for the linkages in this Miller Electric Welder. Rollpins may be used with a free fit in outer or inside members depending upon product design requirements.

6 more examples of assembly-time saving with ROLLPIN

TRADE MARK

Rollpins are slotted, tubular steel, pressed-fit pins with chamfered ends. They drive easily into holes drilled to normal tolerances, compressing as driven. Reaming, tapering, extra assembly steps are eliminated. Rollpins are *locked* in place by the constant pressure they exert against hole walls. Inserted with an automatic press or by hand, Rollpins are readily removable with a drift or pin punch—and reusable again and again.

Elastic Stop Nuts with the famous red collar are another ESNA® product

FOR DESIGN INFORMATION—fill out and mail our coupon. If your plans include applications similar to those on this page—or clevis pins, keys, taper pins or stop pins—you can't afford to be without details on how much faster and cheaper Rollpin can do the job.

Dept. R6-19, Elastic Stop Nut Corporation of America
2330 Vauxhall Road, Union, New Jersey

Please send me the following free information on ESNA self-locking fasteners:

☐ Rollpin bulletin and sample Rollpins ☐ AN-ESNA conversion chart
☐ Elastic Stop Nut Bulletin ☐ Here is a drawing of our product. What fastener do you recommend?

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

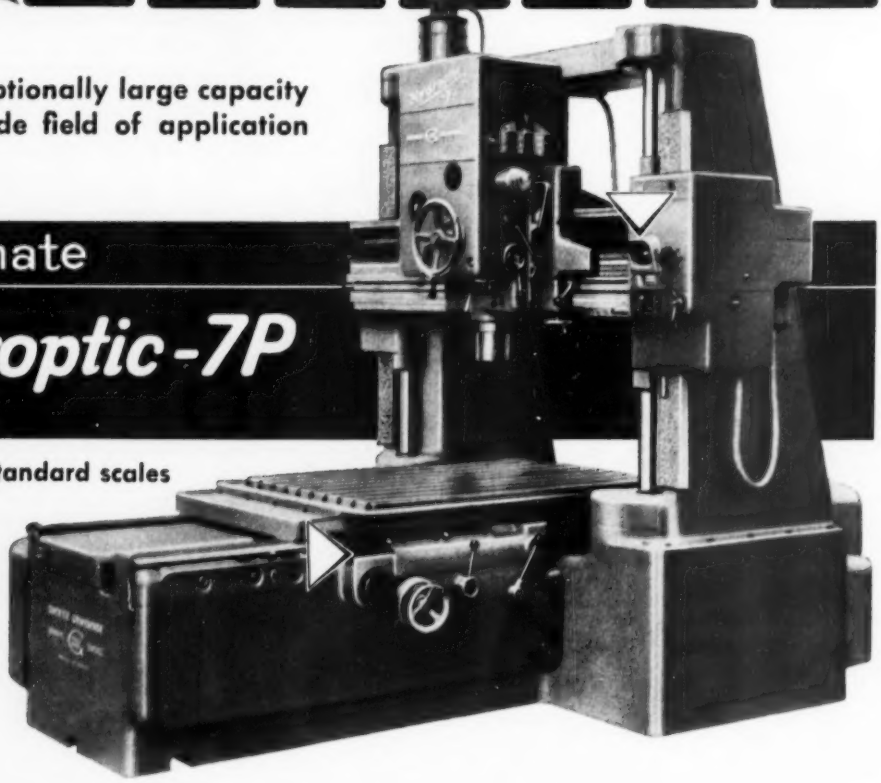
SIP Jig Boring and

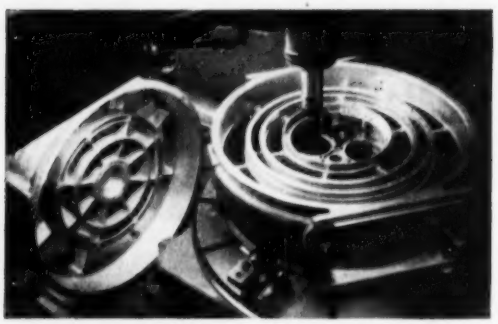
of exceptionally large capacity
and wide field of application

2 coordinate Hydroptic-7P

with built-in standard scales

settings
on projection
screens



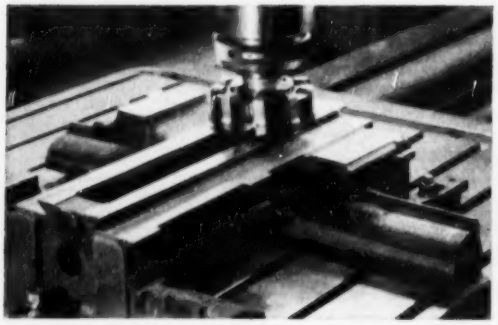


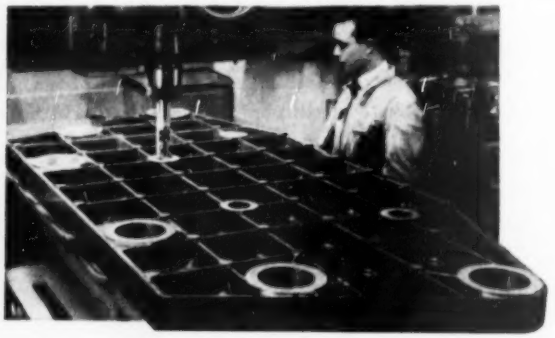
This jig borer of exceptionally wide capacity incorporates built-in standard scales ensuring the high and permanent accuracy of all coordinate settings of the work-table and spindle head. These settings are made in the most simple manner by means of viewing screens on which the division of the scales is projected at a large magnification. Strong and rigid design permits heavy duty work to be handled at fast rates of production.

Guaranteed setting accuracy: .0002 in.

SPECIFICATION

Working range	55 in. × 40 in.	Vertical spindle speeds	40 to 2000 r.p.m.
Distance between uprights	63 in.	Spindle quill travel	12 in.
		Net weight of machine	12 tons





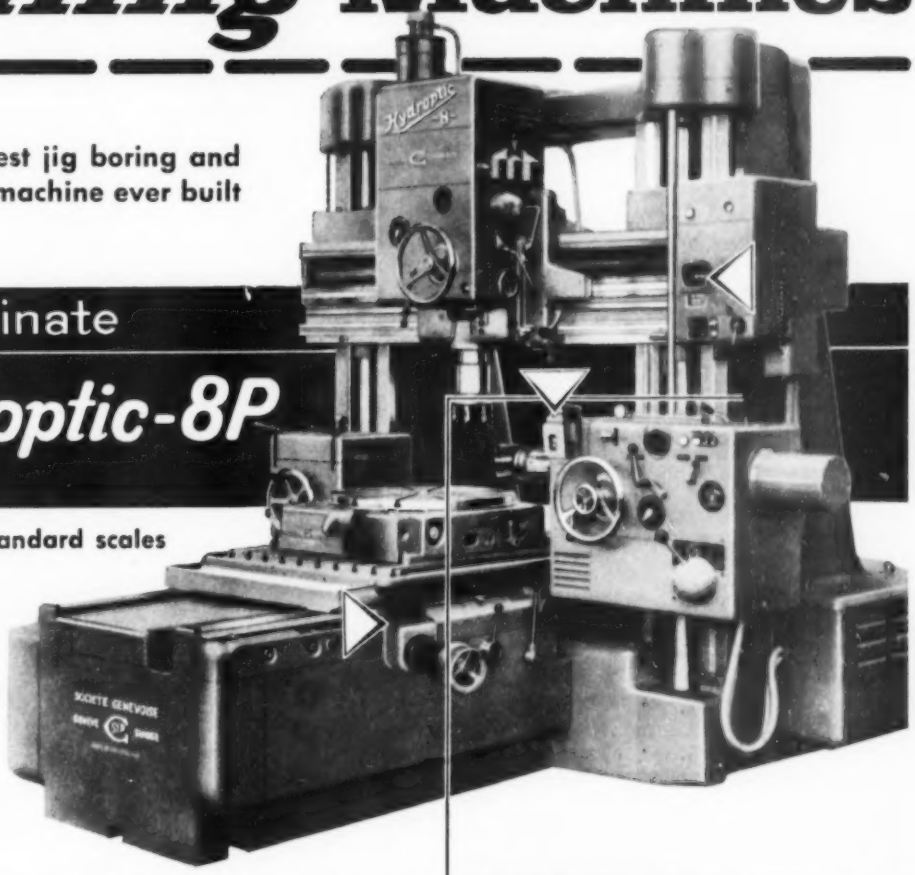
Milling Machines

the largest jig boring and milling machine ever built

3 coordinate *Hydroptic-8P*

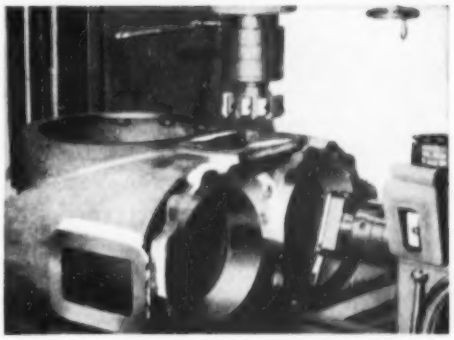
with built-in standard scales

settings on projection screens



Equipped with the same work-table and vertical spindle head as the Hydroptic-7P, this machine is, in addition, provided with a powerful horizontal spindle head the vertical coordinate settings of which are also made on a built-in **standard scale** by means of a projection screen. It is thus possible, in conjunction with the large "Rotoptic" Circular Table, to machine successively and **at one set-up** all lateral faces of a workpiece, or to bore radial holes all around its circumference. Long holes of large diameter are machined, using strong boring bars guided in an outboard-bearing supplied with optical aligning device.

Guaranteed setting accuracy: .0002 in.



SPECIFICATION				
Table longitudinal travel	55 in.	Vertical spindle speeds (18)	40 to 2000 r.p.m.
Vertical spindle head travel	40 in.	Horizontal spindle speeds (25)	40 to 1000 r.p.m.
Horizontal spindle head travel	28½ in.	Spindle quill travel (both spindles)	12 in.
Distance between uprights	57 in.	Net weight of machine	17 tons

REPRESENTATIVE FOR U.S.A. AND CANADA

AMERICAN SIP CORPORATION

HIGH PRECISION MACHINE TOOLS AND MEASURING EQUIPMENT

100 East 42nd Street NEW YORK 17, N.Y.

Like IKE and MIKE...*they look alike!*

Remember Ike and Mike, the two comic characters whom the eye couldn't tell apart?

Here are two bushings, to the eye identical. But right there the resemblance ends.

At the right is an ordinary good bushing of carbon water hardening tool steel. At the *left* is an A·B·C bushing of chromium or chromium tungsten oil hardening tool steel of 18.5% greater wear resistance.*

And to insure that the finer qualities of this premium steel are capitalized to the full, this like all A·B·C Bushings, has been heat treated in a continuous, electronically supervised operation in which every step, including quenching, is under a protective blanket of neutral atmosphere.

This extra A·B·C precaution insures high wear resistance right out to the initial working surface. That is why

A·B·C Bushings last *at least* 18.5% longer

To this add that they are *unexcelled for accuracy and concentricity.*

*See "Special American Machinist Report to the Metal Working Industries"
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A·S·A STANDARD

HEADLESS PRESS FIT
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Also
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UNIFORM CLASS 3 FIT

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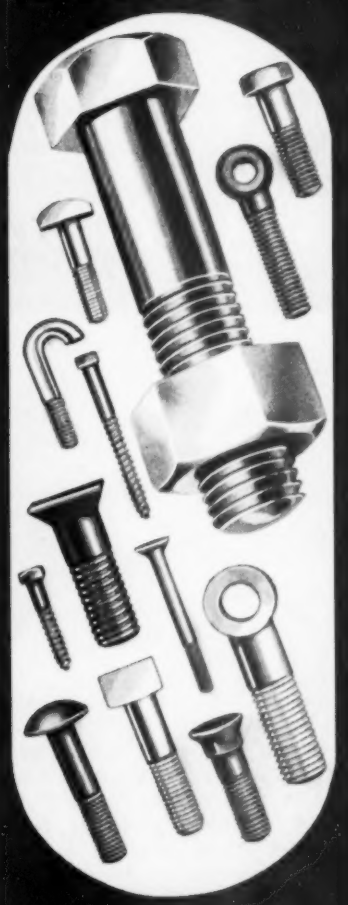
- Alloy Steels
- Stainless Steel
- Silicon Bronze
- Naval Brass
- Monel Metal



You can depend on a uniform Class 3 fit when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MAN"
MANUFACTURING COMPANY
327 Pine Street Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS

for SMALL JIG BORING

PUT SMALL JOBS ON THIS LINLEY MACHINE

and save your larger machines for heavier work.

YOU'LL BE SURPRISED! at the extremely low first cost and the vitally important jobs that this little precision machine can do. It will pay you to get our accuracy information on this machine which has 6" x 10" table movement and 7' x 17½" table size.

Write TODAY for Full Information

LINLEY BROTHERS COMPANY
664 STATE ST. EXT., BRIDGEPORT 1, CONN.

Quality

CANNOT BE ARGUED INTO A GEAR!

"ILLINOIS GEAR" BUILDS IT IN . . .

A gear is right or a gear is wrong. There will be no argument — there will be no compromise with quality when you specify Illinois Gears.

ILLINOIS GEARS

Gears for Every Purpose ... **one gear or 10,000 or more**

ILLINOIS GEAR & MACHINE COMPANY

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GAIN valuable PARKER

Add durability to paint and control corrosion with BONDERITE

A dozen things you use every day are Bonderite-protected. Bonderite, under the paint on automobiles, appliances, office and industrial equipment, guards against rust and corrosion, anchors the paint, adds years to the appearance and service life of the finish.

Bonderite, applied by spray or immersion, converts the surface of metal to a nonmetallic phosphate coating. It is adaptable to varying requirements, operates with simplicity and dependability. It is low-cost, adds greatly to paint performance.

Add maximum corrosion resistance with PARCO COMPOUND

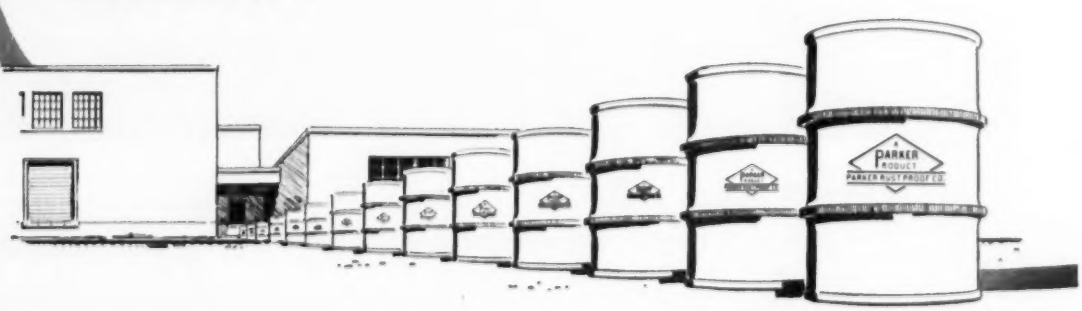
Iron and steel gain most effective protection against rust when treated with Parco Compound. Creates a nonmetallic crystalline phosphate coating over all surfaces of the product treated. Size and shape of product makes no difference—anything which can be immersed in the tank can be treated. Tools, springs, brackets, hardware, ornamental iron, plates, nuts, bolts, and nails are among the hundreds of items on which Parco Compound is used. It's industry's standard rust-resistant product.

Greater efficiency, economy in cold forming of metals with BONDERITE and BONDERLUBE

This is the combination of Parker Products which have put many "problem draws" into production routine. The nonmetallic Bonderite coating—used for years in tube mills for its ability to hold lubricants, minimize galling, lengthen tool and die life—joins with scientifically compounded Bonderlubes. This combination allows deeper draws, more severe extrusions. Saves time, money and materials. Used in manufacture of shell cases, shafts, gears, etc.

Get jet black corrosion resistant coating with PARCO BLACK

Jet black color and effective corrosion resistance from a single bath! Parco Black is not a dye, but chemically converts the surface of iron and steel to produce the protective coating. It is safe, simple, easily controlled. Products to be treated are immersed in a low temperature (about 180°) bath for a few minutes. Corrosion resistance of Parco Black is as much as ten times that of conventional "blacks."



advantages for your products by using a metal surface treatment . . .

Get increased wearing quality on friction surfaces with PARCO LUBRITE

This Parker product creates a nonmetallic phosphate coating on friction parts and bearing surfaces. Its action is to prevent metal-to-metal contact, hold lubricant, prevent galling and scratching. Smooth, easy break-in is assured, and longer subsequent service life is promoted.

Used with great success on gears, shafts, pistons, piston rings, valves, cylinder linings, etc.

Protect structural steel, large fabrications with "Bonderite-quality" PARCO PRIME 47

Now, steel structures and big fabrications can have the benefits of Bonderite-quality corrosion resistance and paint adhesion. Parco Prime 47 can be sprayed or brushed on, quickly conditions the metal to take and hold prime and finish coats. Recommended for bridges, tanks, truck and trailer bodies, structural steel, freight cars.

Clean your production with a cleansing and conditioning PARCO CLEANER

The Parker line includes alkali, acid and emulsion cleaners formulated not only to remove grease and soil but to condition the work for the next step in finishing as well. There's a Parco Cleaner to meet your conditions of soil, production requirements and finishing operations.

Use PARCOLAC to stain, wax, or oil-finish parts

This group of products is made up of various finishes for use after Parco Compound. Includes wax base finishes, stains, and rust preventive oils suitable for application by dip, spray or centrifuge. Can meet fast or slow drying requirements. Parcolacs add to appearance and performance qualities of articles treated.

FIRST SINCE 1915

Parker

RUST PROOF COMPANY

*Bonderite, Bonderlube, Parco Compound, Parco Lubrite—Reg. U.S. Pat. Off.

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- ☐ Parco Lubrite
- ☐ Parco Compound
- ☐ Parco Black
- ☐ Parco Prime 47
- ☐ Parcolacs
- ☐ Parco Cleaners

PARKER RUST PROOF COMPANY
2196 E. Milwaukee, Detroit 11, Michigan

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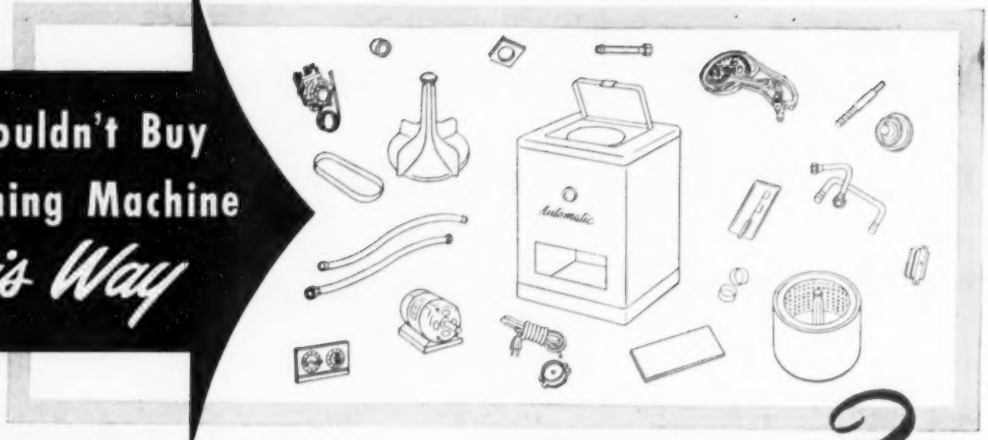
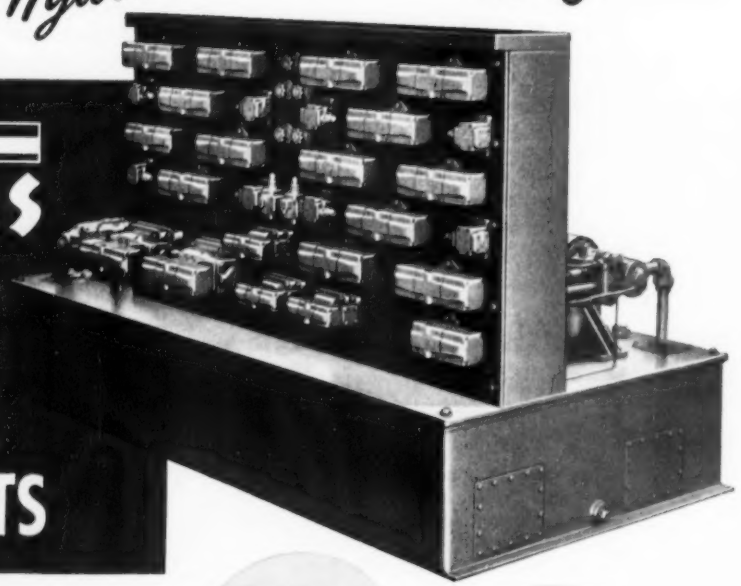
You Wouldn't Buy a Washing Machine *This Way*



Then Why Buy Hydraulics Piecemeal ?



VICKERS *Custom-Built* HYDRAULIC POWER UNITS

You would never go to the trouble of buying automatic washing machine parts and assembling them yourself. It would take a lot of time and patience and trouble. For one thing the maker could not risk guaranteeing the finished job. You buy a washing machine as a unit, and want the undivided responsibility of the manufacturer.

Then why buy hydraulics piecemeal when there are so many advantages in a Vickers Custom Built Power Unit? It is built to meet your individual requirements, in a compact, neat, self-contained "package." It includes all necessary pumps, valves, intermediate piping, oil reservoir, motors, controls etc. as well as all hydraulic accessories (oil filters, air cleaners, oil level gauges, fittings etc.). Hydraulic connections are grouped in a convenient manifold.

Hydraulic design is simplified and improved, and you save substantially on installation and maintenance cost. Vickers takes undivided responsibility for the entire hydraulic system and you get the benefit of Vickers skill and experience. These advantages are important to both the machine builder and his customer.

Ask the nearest Vickers factory-trained application engineer to send you new Bulletin 52-45 or to make a personal call.

Improve and Simplify Hydraulic Design

Reduce Installation and Maintenance Costs

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No. 1 because Allen○Screw products identify equipment that is designed right, built right. Allen screws, with more durable threads and sockets make adjustments, disassembly and reassembly easy and trouble-free.

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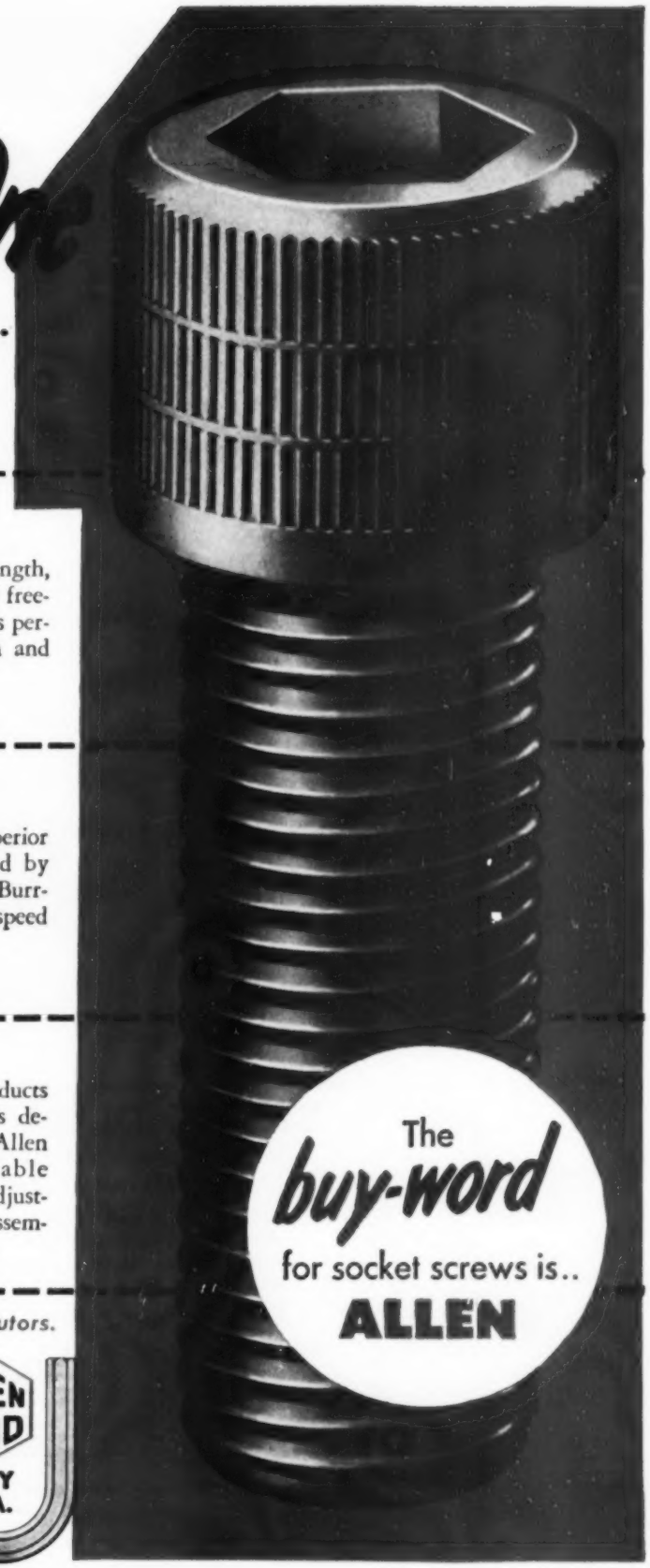

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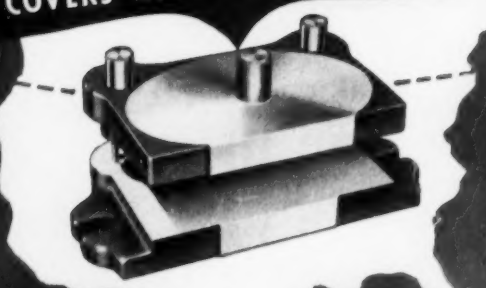

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Your "Detroit" Die Set man knows die sets. Call him in . . . talk over your die set problems with him. Get from him full facts about the accuracy of "Detroit" parallel surfaces, the trueness of pins, the fine finish, the thorough inspection at the factory. You'll see that "Detroit" leaves nothing undone to assure easier mounting and longer production runs. Call your "Detroit" man.

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This motor-driven machine cuts grinding and drilling costs 50% and more, saves expensive drill stock, reduces work spoilage and drill breakage.

SAVES—50% & more on Sharpening Small Drills. SAVES on Drilling Time. SAVES by Reducing Work Spoilage. SAVES in Every Use of Small Drills.

Sharp, small gauge or fractional drills in quantities cost real money to put an experienced mechanic to work on them.

With a Black Diamond, however, anyone can keep all small drills sharp—with lips ground to exactly the same length, proper angle and with correct clearance for fast, precision drilling.

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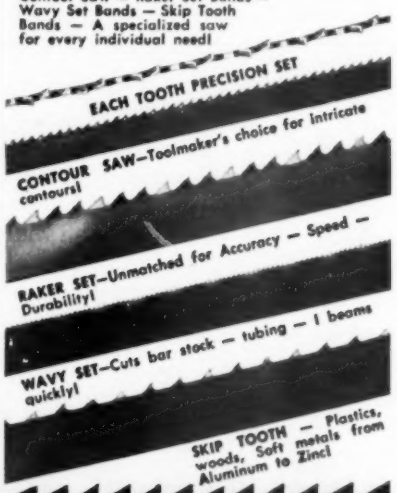
Here each roll of Atlantic raw band saw stock is subjected to initial quality control tests. After manufacture, each Atlantic Band Saw Tooth is precision gauged — your assurance of a perfect, standard set through every inch of saw stock. Atlantic saws *stay* accurate, too! Individually milled and heat hardened teeth retain their original set in daily use — cut true clean through — and leave score-free, mar-free finishes. From gang cutting to intricate contours, look to Atlantic Band Saws to do your every cutting job *better!*

SEND FOR LITERATURE ON THE ATLANTIC QUALITY BAND SAW LINE - TODAY!

Contour Saw — Raker Set Bands — Wavy Set Bands — Skip Tooth Bands — A specialized saw for every individual need!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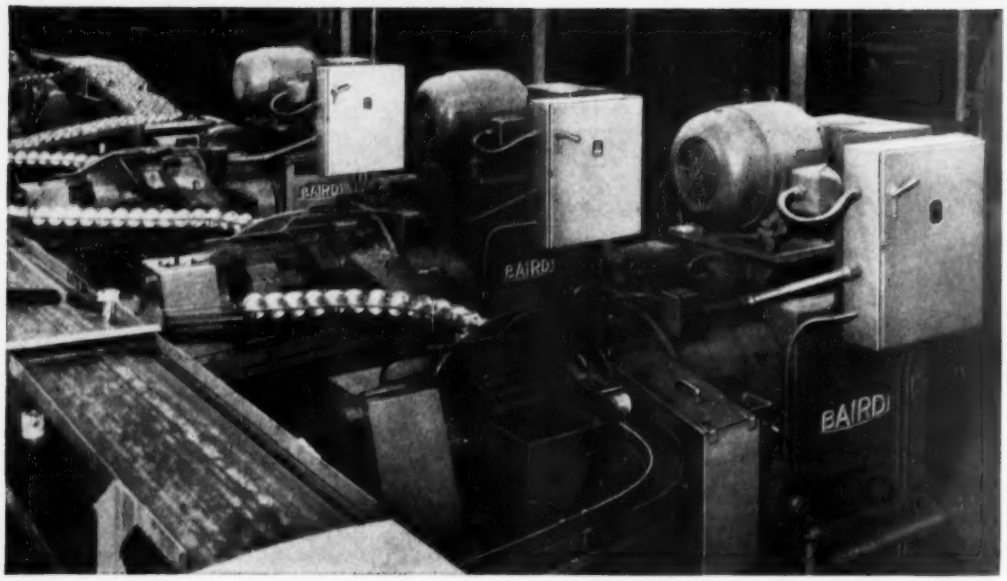

BAIRD *Automatic* CHUCKING MACHINES

Join mass production lines at new FORD plant

The Baird Machine Company is pleased to share, with other manufacturers of modern automatics, in the high speed production at the Ford Motor Company's new Cleveland Engine Plant.

Shown above is a battery of Baird Chucking Machines. They completely finish-turn the engine piston, and finish the oil ring grooves to size. Machines are automatically loaded from the conveyor and automatically discharge the pistons when they are completed. Operations are fast, continuous, and to close-tolerance machining.

The Baird 76H Chucker (7"-chuck, 6-spindle, horizontal machine) combines, in a single automatic indexing cycle, such operations as turning, facing, drilling, tapping, threading, grooving, and chamfering . . . if desired. Automatic electrical and mechanical safety devices prevent damage when setting up, when loading is not within cycle time, or when any motions are out of sequence.

Other valuable features are: easy access to all tooling, individual tool slides, individual spindle speeds, automatic chucking, maintained accuracy over a long service life.

If you require repetitive production of this nature . . . either hand load and unload, or entirely automatic . . . ask Baird engineers for details.

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AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON METAL FORMING
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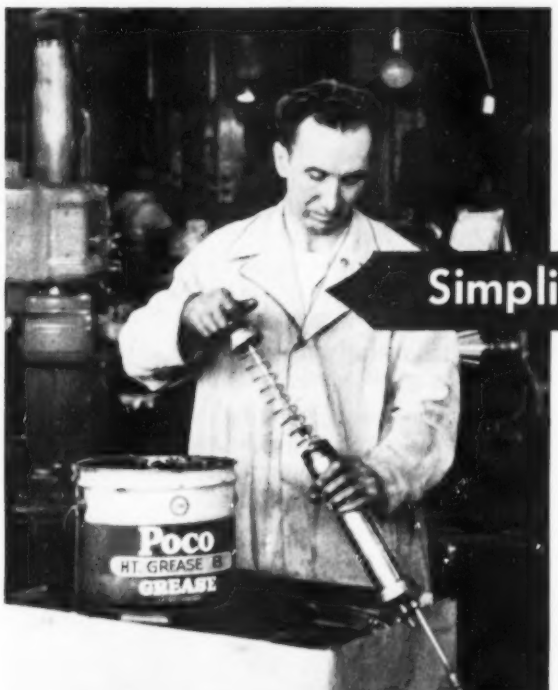
HUNDREDS OF MACHINES—BUT ONLY ONE GREASE!

Read how another manufacturer simplifies and saves with

PURE OIL INDUSTRIAL LUBRICANTS

BE SURE PURE WITH PURE



A large midwestern metal-working plant produces chrome-plated trim (hub caps, grills, etc.) for the automotive industry. All types of metal-working equipment —400-ton presses, shears, drills, lathes, roller-levelers and grinders—are used as well as huge chrome-plating machines. Yet *only one grease*—Pure Oil's POCO HT GREASE B—and one dispenser is used for *all* applications! And in 3 years there has been no down time due to lubrication failures.

Simplify and Save

Here at Pure Oil we specialize in industrial oils and greases designed to do several *different* jobs—instead of one specific job.

And to do each job equally well.

For this reason, our technical experts can nearly always help you to reduce your lubricants inventory . . . simplify your lubricating procedure . . . minimize waste and error.

One of our technical experts will be glad to give you full details, right away. Just call your local Pure Oil office* or write:

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How do you select A PORTABLE POWER TOOL?

One tool engineer is influenced by light weight — another by high speed — a third by ease of handling — others by low power requirements or low maintenance.

Important as all these advantages are — the deciding factor should be the *work productivity* of the tool.

SUPER CYCLE ELECTRIC TOOLS have 10% to 20% greater productivity than any other type of portable tool. This can be demonstrated in your own shop, under your own operating conditions.

If you use, or can use, six or more portable tools in one location, we shall be glad to arrange for a demonstration of the advantages of SUPER CYCLE ELECTRIC TOOLS.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

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PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
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PHOSPHATE COATINGS

Three operations— ALL with ONE LUBRICATION

BLANK AND FIRST DRAW

FIRST REVERSE DRAW

SECOND REVERSE DRAW

EXTRUDITE PROCESS simplifies

drawing operations through better lubrication!

The Extrudite Process chemically interlocks the lubricant to the work surface . . . metal-to-metal friction is prevented even during the most severe working conditions. As a result cold forming operations can be speeded up on present equipment, parts are produced with less scrap and many process anneals and chemical treatments are eliminated.

Shown above are cases for hermetically sealed electronics transformers, designed to meet rigid MIL-T-27 Specifications, and being produced by the General Electric Company. Previously, three lubrications were needed and the last one was made with pigmented drawing compound . . . hard to put on due to the contour—requiring a difficult cleaning operation to remove. With the Extrudite Process, only *one* lubrication is used, which is applied on the flat stock. Further, the metal cleaning operation after drawing is greatly simplified. As an added benefit, the drawn parts are protected by Extrudite against rust if stored before the next operation.

If you are now performing cold forming operations—such as drawing of sheet, tube or wire; room temperature extrusions; cold heading—investigate the Extrudite Process. **Detrex Corporation, Box 501, Detroit 32, Michigan.** x-a

Details of the Extrudite Process and its advantages are contained in this informative bulletin. Send for yours today, there is no obligation.

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DEGREASERS • DEGREASING SOLVENTS • WASHERS
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PHOSPHATE COATING PROCESSES

high boring costs make you blue?

LET THE MAN WITH HOLES IN HIS HEAD LOWER THEM FOR YOU

Every Madison cutter, and bar, no matter what its size, is designed to do your boring operations faster at lower cost. With Madison cutters and bars you never get those high-boring-cost-blues.

Madison *cutters* range in diameter from 5/8" to any desired size. Madison *bars* range from 2 1/2" to fourteen feet in length . . . or longer. The secret of Madison's ability to cut costs is Madison's exclusive cutter and bar design. First, there is Madison's two bladed cutter. It provides generous chip clearance . . . permits faster cutting without overheating. Second, is Madison's exclusive float design. Cutters float in Madison bars, special floating tool holders are never needed . . . both edges of the cutter take an equal bite. That means more holes per cutter, longer cutter life with fewer regrinds. You get these features, plus many other Madison advantages, when you ask the "Men With Holes in Their Heads" to cut your boring costs. Write today. A brief letter will do.

Write for the information filled Madison catalog: It is yours for the asking.

Tools for rough boring; finish boring; combination rough and finish boring, multiple cutting, bottoming; and other special tools.

MADISON MANUFACTURING CO.

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① **1001 DRILLING SPEEDS INSTANTLY CHANGED** without stopping motor is a time-saving convenience that makes the "Buffalo" "RPMster" so popular in the finest shops. Motor and patented Variable Speed Drive are totally enclosed.

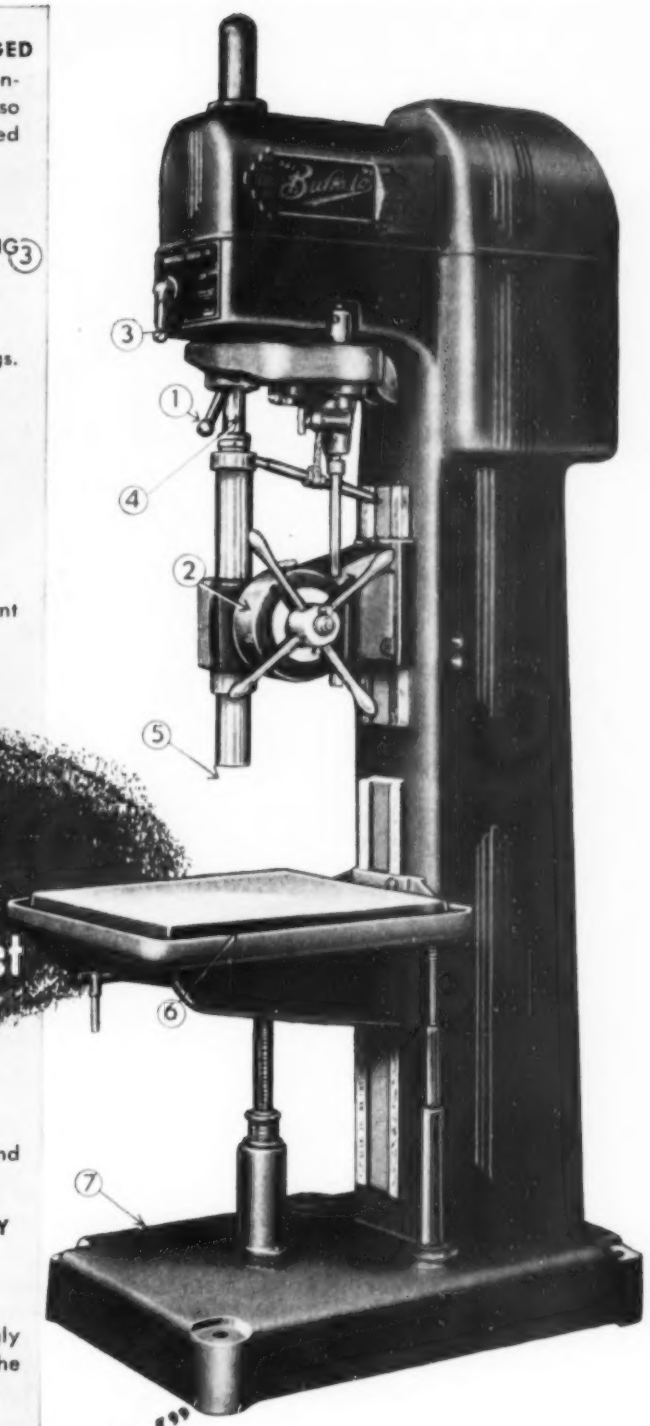
② **POWER FEED** all-geared construction — plus BACK GEARING ③ available.

④ **6-SPLINE ALLOY STEEL SPINDLE** precision machined and running on ball bearings.

ALL CONTROLS EASY TO REACH by operator in normal working position.

AUTOMATIC FEED HANDLE REVERSE TAPPING CONTROL Available

⑤ **27" SPACE!** Here's a 13" overhang and 0" to 27" adjustment between working table and spindle nose.



⑥ **23" x 22" WORKING SURFACE** crank-adjusted, with oil-and-chip channel and hand-scraped dovetail slide.

⑦ **MASSIVE RIGIDITY FOR GREATEST ACCURACY** and long life. Machine is 100" high.

WRITE FOR BULLETIN 3257A for all details on this highly accurate, amazingly easy-to-handle machine used in many of the country's leading shops.

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"Buffalo" MACHINE TOOLS

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Ⓡ METAL CUTTING TOOLS

For 30 years, we've turned out fine circular metal cutting tools. We've kept up with every advance — and we're ready now to meet the needs of tomorrow's more fully automatic production machines.

Circle R tools are made in a wide range of most-used sizes — and special sizes or designs will be made up promptly on your order. Write for details, or look us up in the phone book and talk with our nearest representative.

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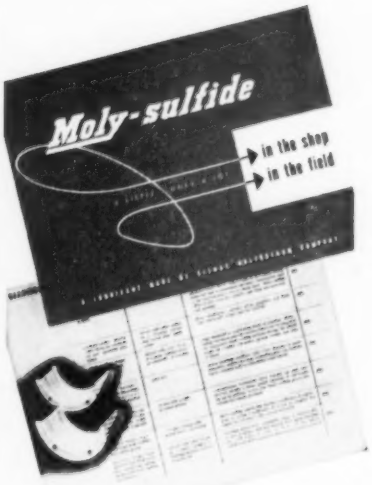
From the *American Machinist* Library of *Tips for Top Shop Men*

SLAVERY was not abolished by Lincoln. He did end physical slavery, but man himself must end mental slavery to habit. Education will help, but the real problem is to breed a race of open-minded, inquiring men who welcome the chance to wonder, to question and to analyze—then to take a chance on a new idea that looks sound.

PROCEDURE for methods improvement: Pick an operation to be improved. Put down in writing what happens—the details. Challenge each detail in order. Where a chance for improvement appears, develop the better method. Apply it on the job.

154 ideas on ways to use...



154 varied applications of molybdenum sulfide in the shop and in the field are described in a new booklet now available. This solid-film lubricant has demonstrated unique anti-friction properties under conditions of extreme pressure, high velocity, elevated temperature, or chemical attack.

The 40-page booklet contains the records of solved lubrication problems — some might solve your own.

Moly-sulfide
A LITTLE DOES A LOT

The lubricant for extreme conditions

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Please send me your Free Booklet on *Moly-sulfide*
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MOLY

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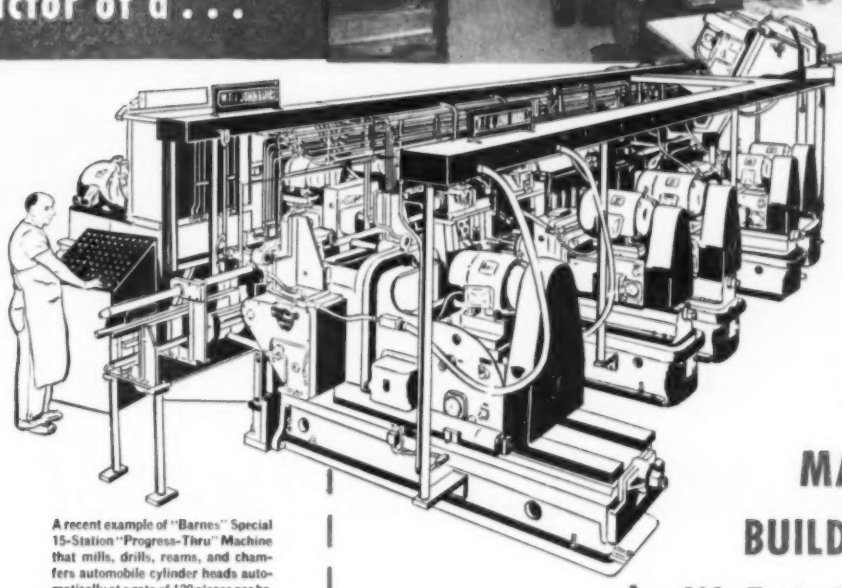
COORDINATED DESIGN and ENGINEERING important creative factor of a . . .

Partial view of Special Machine Engineering Department at Barnes.



A recent example of "Barnes" Special 15-Station "Progress-Thru" Machine that mills, drills, reams, and chamfers automobile cylinder heads automatically at a rate of 120 pieces per hr.

6-POINT MACHINE TOOL BUILDING SERVICE by W. F. & JOHN BARNES

BARNES SPECIAL MACHINE TOOL BUILDING SERVICE INCLUDES . . .

1. SPECIALIZED MANUFACTURING FACILITIES — 75 year background, large well equipped plant efficiently tooled to produce high production machines.
2. SPECIAL HYDRAULIC EQUIPMENT — designed and built to meet JIC standards. Individually engineered units assure smooth, dependable actuation for every requirement.
3. SPECIAL GAUGES, FIXTURES, TOOLS — designed for each individual machining problem, assure accuracy of operations at high production speeds.
4. SPECIAL ELECTRICAL EQUIPMENT and CONTROLS — individually designed and built for maximum safety and ease of control with circuits that assure the most dependable coordination of all machine functions.
5. SPECIAL HANDLING AND CONVEYOR EQUIPMENT — designed and built to reduce work handling, effect maximum safety and efficiency.
6. COORDINATED DESIGN AND ENGINEERING — as briefly outlined.

Group Planning Saves Time and Trouble

The creative and engineering skills of Barnes people today encompass a much broader field of industrial activity than ever before in the company's 75 year history. Thoroughly experienced mechanical, hydraulic, electrical, process, tool and fixture engineers work together toward a common goal. As a result you get the benefit of a coordinated effort that saves time and trouble. Interchange of ideas insures constant progress in developing new and better methods for increasing productivity and lowering costs.

Undivided Responsibility Improves Results

In addition, because all planning, engineering, and manufacturing efforts at Barnes are closely coordinated, you get a complete machine tool building service all from one convenient, dependable source. Experience gained over the years enables Barnes Engineers to help you solve complex machining and production problems quickly. When your present or future machining needs call for faster, more efficient methods, it will pay you to call on Barnes for recommendations. No obligation.

W. F. & JOHN BARNES

W. F. & JOHN BARNES COMPANY
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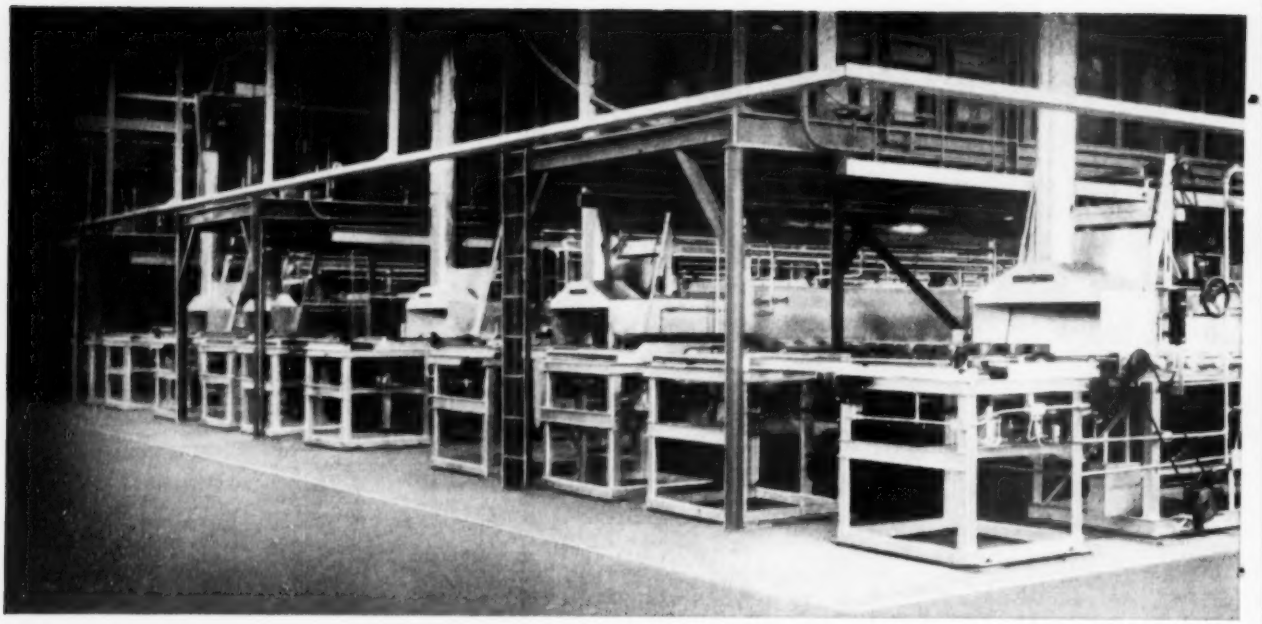
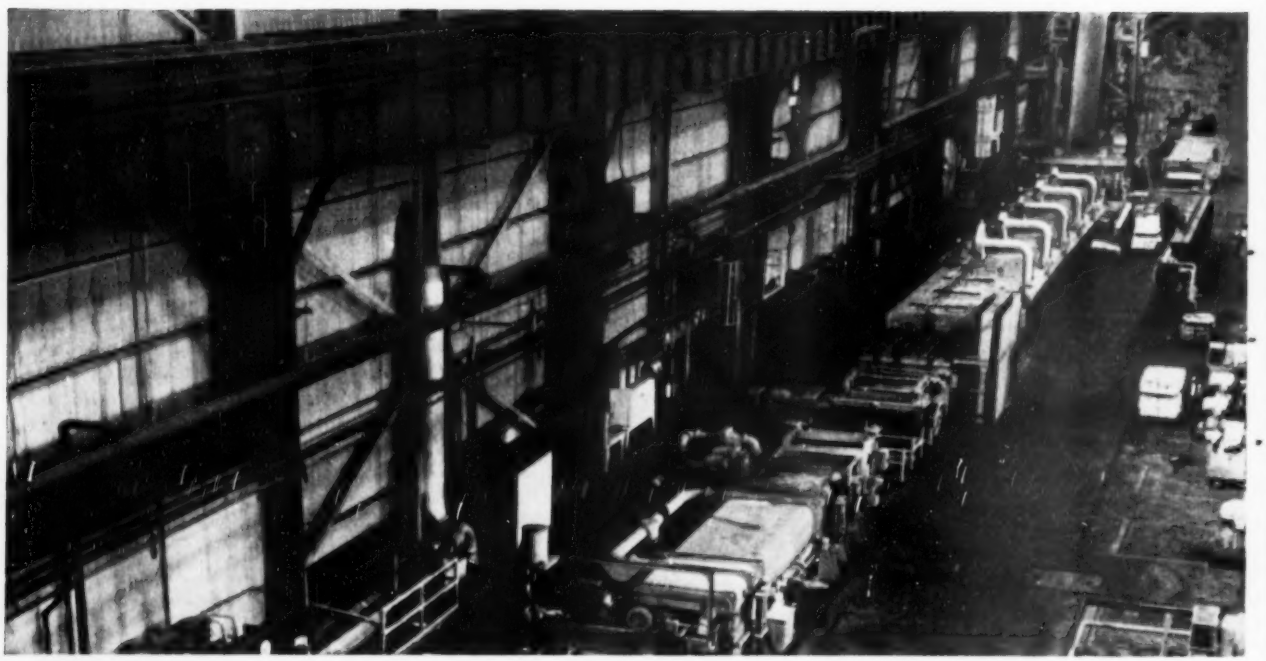
Ask for free booklet "Coordinated Machine Engineering" describing the scope of Barnes machine tool building service. Illustrates and describes modern machines and mass production techniques.

MULTIPLE SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC PROGRESS-THRU AND TRANSFER TYPE MACHINES

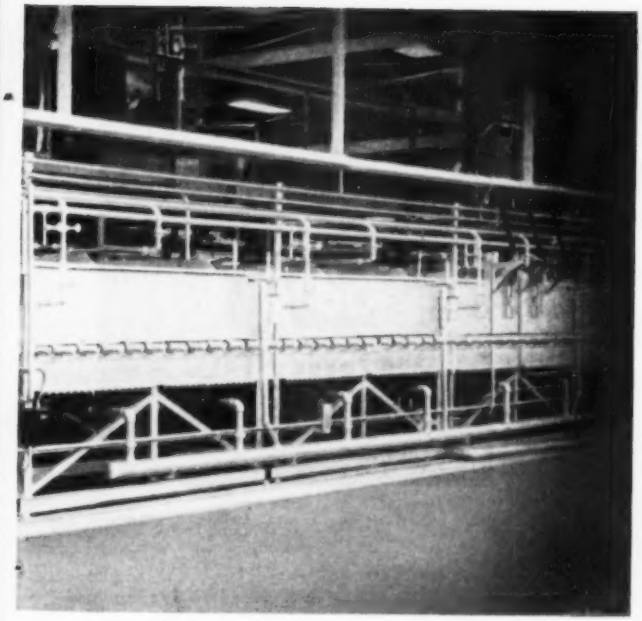


THE EXACT EQUIPMENT to fill your requirements can usually be built from existing G-E designs. Like these five standard roller-hearth annealing furnaces, your equipment can be shipped quicker and will cost you less. G-E Heating Specialists, located in major cities throughout the country, have wide knowledge of your heating

Why You Should Ask For a G-E Bid



CORRECT INSTALLATION is an accepted fact when you specify G-E equipment and supervision. This electric furnace and induction preheat section were designed to meet customer's exact requirements for continuous annealing and galvanizing of steel strip. Experienced installation men supervised the complete set-up.



processes and can assist you in selecting the proper furnace or induction heater. Let him help you to solve *your* problem, as he did for this plant . . .

THE PROBLEM: To sinter carbides at 3000F. in a neutral atmosphere, with temperature variation of ±0.1%. *Standard* G-E equipment fit each requirement.

On Furnaces and Induction Heaters

FAST SERVICE WORK? During World War II, six huge elevator furnaces annealed aluminum at a southern plant. When their Chicago plant opened, the Chicago G-E Service Shop quickly dismantled and transported these furnaces to the new plant, then rebuilt and erected them as bell-type furnaces. The shop nearest you is just as willing to do the large or small repairs you may need—and their phone is answered at any hour.

THE RESEARCH DISCOVERIES and engineering advances in heat-treating made by G-E laboratories are passed on to you as better equipment, and as invaluable process information. From General Electric has come such developments as furnace brazing, the first resistance-electric furnace, stepless temperature control for electric furnaces, the first protective gas-atmosphere producer plus pioneering work on electronic induction heating. We shall continue to earn your respect and business by providing the highest quality equipment and the most advanced designs to fit your exact needs.

WHEN YOU DEAL WITH G-E on heating equipment, here is what you receive: (1) proper equipment from hundreds of existing designs—or we will build special equipment to suit your needs (2) correct installation supervised by experienced men (3) experienced application men to help solve your heating process problems (4) fast repair work from nearby G-E Service Shops (5) plus development leadership on products and processes. Consider G-E equipment for these heating processes: brazing, sintering, porcelain-enameling, wire-enameling, general heat-treating, and annealing malleable iron.

ASK FOR THE SERVICES of a G-E Heating Specialist when you have heating problems or are considering new heating equipment—call the nearby G-E Sales Office, or write General Electric Company, Schenectady 5, N. Y. Consider well his proposal for it is no idle boast when we say of G-E furnaces and induction heaters . . . 720-60E

You can put your confidence in—

GENERAL ELECTRIC

Now . . . 2 New
AO COVERGLAS GOGGLES
Fit Over Safety And Personal Glasses

NEW
Safety Goggles

#326

#327

NEW — 4 WAYS!

1. New Cup Size and Shape
2. New Lens Size and Shape
3. New Side Shields
4. New Easy Lens Replacement

AO's newest development in eye protection—Chippers' and Welders' Coverglas Goggles—can be worn over practically every pair of personal glasses (even the biggest frames) and most types of safety prescription goggles *with and without side shield.*

Wider vision, too, because the lenses are larger and scientifically designed to give up to 20% more vision. Yet, with all these features the goggles weigh but a fraction of an ounce more than ordinary Coverglas goggles . . . cost only slightly more.

These goggles are the newest . . . and two of the greatest . . . developments since the advent of safety goggles. Get all the facts about these two outstanding Coverglas goggles from your AO Safety Products Representative. He can supply you.

QUICK FACTS

- Lens easily replaceable from rear (not front) by means of a spring clamp—no tools needed
- Lightweight, brown plastic cups fit face snugly, won't conduct heat or electricity
- Light-tight side shields for welders (on No. 327 goggle) provide indirect ventilation
- Bridge—High-grade leather. Instant adjustment
- AO worker-lab tests show much greater field of vision and increased comfort
- All-rubber headband, easily adjustable

"326" Chippers' Coverglas goggle supplied with regular Super Armorplate lenses. "327" Welders' Coverglas goggle supplied with regular Noviweld lenses and cover lenses.

AO's Industrial Vision Program Increases Production, Decreases Accidents. Write today for booklet "Improved Industrial Vision" to 1011 Vision Park, Southbridge, Mass.

American Optical COMPANY
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

Bodine CASE HISTORY NO. 32

...AN AUTOMATIC ASSEMBLY OF STUD, SPRING AND SLEEVE

PRODUCTION: This Bodine No. 40-10 Dial Type automatic assembly machine produces 1500 completed parts per 50 minute hour at 30 strokes per minute. One operator can attend several machines. Top view shows tooling with 3 Syntron type hoppers to feed stud, spring and sleeve. Tolerance held to overall height of ±.008. Our engineers provide an overall service to solve your specific problems with Bodine automatics and tooling for drilling, milling, tapping, screw insertion and assembly.

You can't meet Tomorrow's Competition with Yesterday's Machine Tools

THE
Bodine
CORPORATION
BRIDGEPORT 5, CONNECTICUT

AUTOMATIC DIAL TYPE DRILLING, MILLING, TAPPING, AND SCREW INSERTING MACHINES

GRITCLOTH

TOMORROW'S SANDING FABRIC TODAY!

USE WET OR DRY BAY STATE (R) NON-CLOGGING

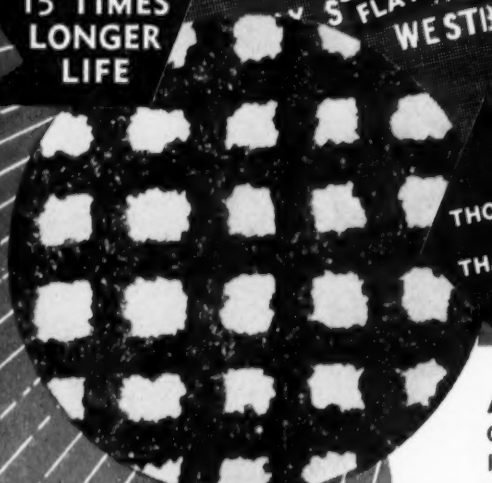
USE BOTH SIDES No. 320 GRITCLOTH By Machine or Hand

FLAT OR FOLDED

BAY STATE ABRASIVE PRODUCTS
WESTBORO, MASS.

10 to 15 TIMES LONGER LIFE

LONG LIFE



THOUSANDS OF SUPER-SHARP EDGES THAT KEEP ON CUTTING

SEND FOR SAMPLE!

ANOTHER SPARKLING BAY STATE "FIRST"! Once and for all, **GRITCLOTH** solves the age-old problem of clogging sandpaper and other types of coated papers. GRITCLOTH'S revolutionary open-mesh design lets the removed particles flow right through, and the sharp abrasive teeth keep right on cutting. Actual tests show 10 to 15 times the life of ordinary coated papers.

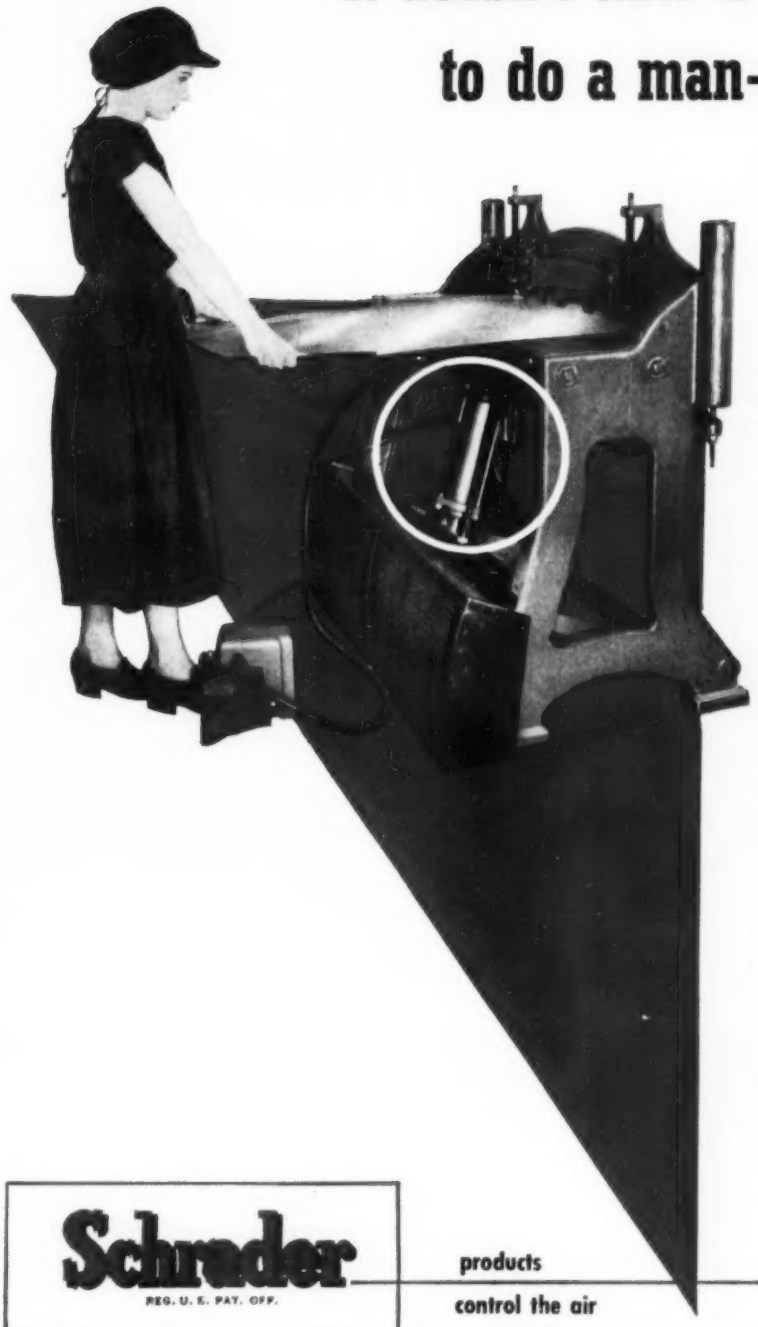
For all finishing jobs on either wood or metal, **IT'S GRITCLOTH TODAY.**

IT'S NEW IT'S BETTER IT'S BAY STATE

BAY STATE

BAY STATE ABRASIVE PRODUCTS CO., WESTBORO, MASS., U. S. A.
Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

It doesn't take a heavyweight to do a man-sized job



Before these shears were shifted to air operation the entire weight of a man was required on the foot treadle to cut the sheet metal.

All this is changed now. A light touch of the girl's foot on the pedal puts all the power of the Schrader Air Cylinder to work, sending the knife-edge through the metal.

This is just one example of how air cylinders can speed up production and reduce fatigue . . . one of many hundred applications of Schrader cylinders and valves. It will pay you to design your controls around Schrader air cylinders and valves.

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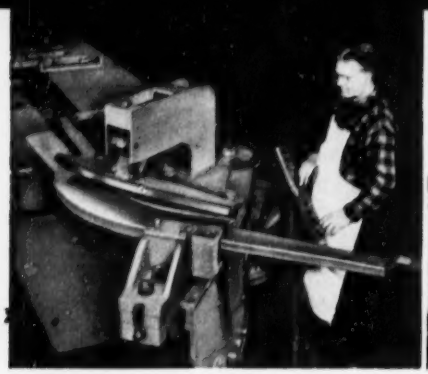
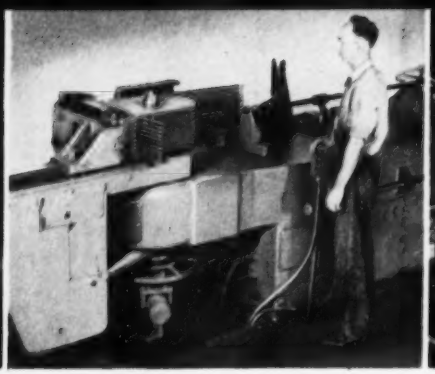
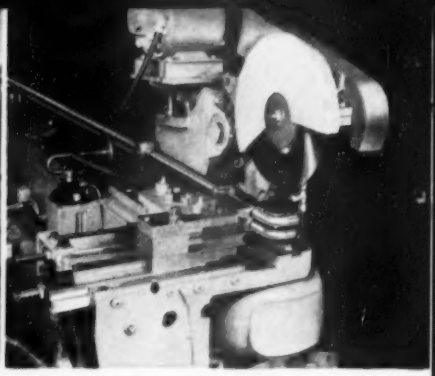


HEAVY, TAPERED HOLLOW SECTION — Pieces fabricated from 2 tapered welded strips of 12 gauge steel stock are given a 34" radius bend and a 41° edge bend on a Pines Size 4 Bender.



STEEL RODS — Multiple groove die on Pines Size 3 Automatic Bender forms ten 7/16" x 67-1/4" steel rods simultaneously to a 22" radius for farm implements.



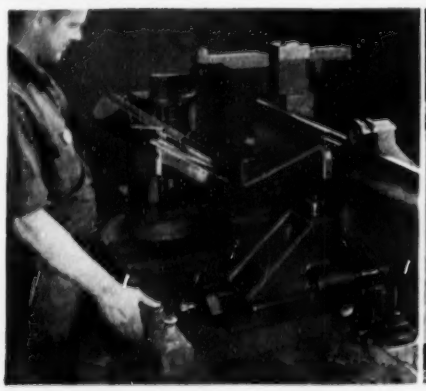
COPPER ELLS — 3/4" ells are formed to 7/8" c/l radius and cut off automatically two at a time from 20 ft. stock lengths on a Pines Size 3/4 Bender.

For NEW IDEAS in METAL FORMING

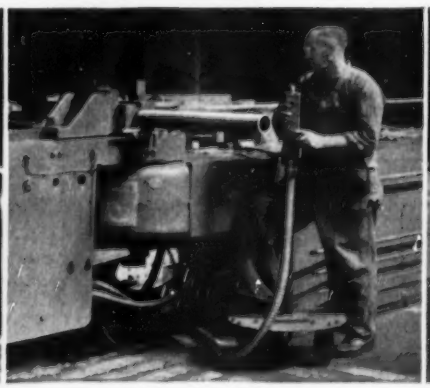
SQUARE TUBING—An eight foot length of SAE 4130 steel tubing 3" square, 1/4" wall, is compound bent to close tolerances. Segment mandrel maintains smoothness of the 10" inside radius bend.

investigate PRODUCTION BENDING the "PINES-WAY"

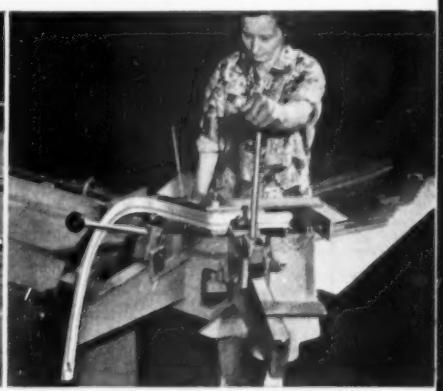
When you have a production problem of cold forming parts from round, square, rectangular, extruded or hollow stock to an even radius, or to different angles, chances are you will find the job can be handled more profitably on a Pines Automatic Bender. The examples shown here are only a few of the many different applications, in addition to ordinary tube bending, that are today handled efficiently on Pines machines. Production-wise and cost-wise, you will find bending the "Pines-Way" is a more accurate and profitable metal forming process. Investigate production bending today. Call on Pines engineers for assistance without obligation.



SQUARE STEEL BARS — Compound bends at each end and large center-radius helix are cold formed on a Pines Size 2 machine. Tooling costs reduced 75%, half of the production operations eliminated.



4" I.P.S. EXTRA HEAVY PIPE — Cold forming in place of hot bending on this Size 4 Pines bender eliminated a costly pickling operation at Allis-Chalmers' West Allis plant.



EXTRUDED ALUMINUM — Part of a production line set-up in a large aluminum fabricating plant, this small Pines Semi-Automatic bends an intricate extruded moulding for automobile window frames.

PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery

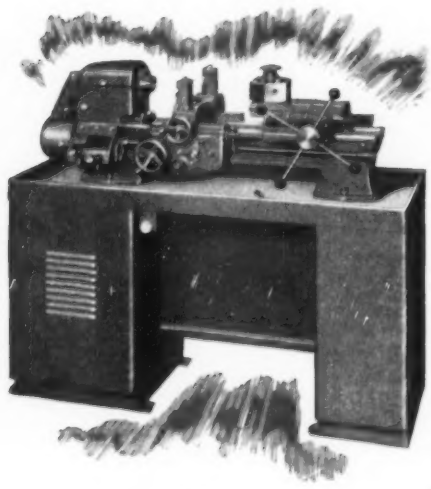
672 WALNUT • AURORA, ILLINOIS

WRITE FOR *Free* DATA SHEETS

To keep abreast with bending, ask to be placed on the mailing list for "Pines News", bi-monthly mailing piece that gives facts and figures on new unusual production applications.

BENDING • DEBURRING • CHAMFERING • THREADING MACHINERY

"Darling, Dad says our elopement is almost as economical as his



No. 935—2
QUICK CHANGE GEAR TURRET LATHE
11" Swing, 1" Collet Capacity,
1⅜" Spindle Hole, 43⅛" Bed

Logan LATHES!"

NO OTHER LATHE of comparable specifications can match the Logan in economy. Low power cost is only one reason why industry likes the Logan. It is easily set up for every type of lathe operation. Its ball bearing spindle needs no adjustment for any speed from 45 to 1500 rpm, a feature that saves maintenance costs and prolongs spindle accuracy. Vital wear points throughout the lathe are protected by self-lubricating bronze bearings. The lasting accuracy that results from rugged, accurate overall construction keeps production at peak efficiency and holds costs down. With its 11" swing and 1" collet capacity the economical Logan can hold the costs as well as the tolerances on much of your lathe work.

See your Logan Dealer, or Write for the Logan Lathe Catalog

LOOK TO LOGAN FOR BETTER LATHES AND SHAPERS

LOGAN ENGINEERING CO.

4901 West Lawrence Avenue, Chicago 30, Illinois

220 Delpark FILTERS

SPEED PRODUCTION

AT

Continental Motors Corporation

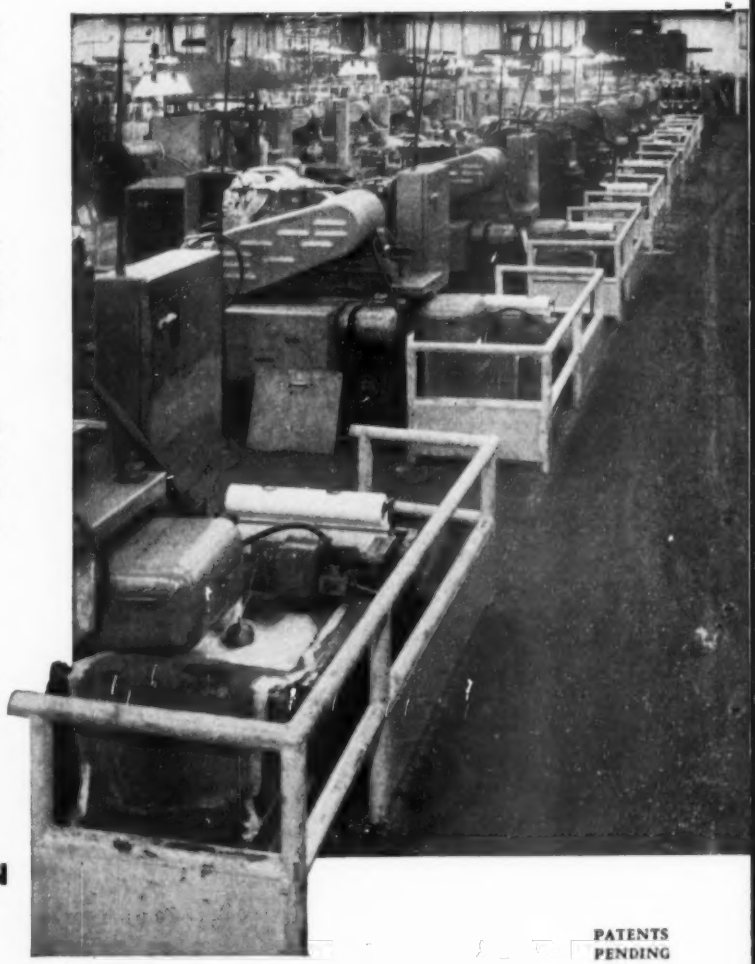
MUSKEGON, MICHIGAN

The value of clean coolants for grinding operations is certainly recognized by the Continental Motors Corporation in Muskegon, Michigan. Here, in the grinding department, 220 Delpark Filters remove swarf and wheel particles from the coolants supplied to Norton grinders.

Through the use of full flow, self cleaning Delpark Filters, clean coolant is supplied to the cutting wheel assuring a greater accuracy, less wheel dressing, greater machine efficiency, and lengthened coolant life.

If you have machine tools which require the use of soluble oils or cutting oils in machine operations, there's a place for Delpark Filtration to save you money, increase production, and improve machine efficiency.

WRITE TODAY FOR OUR NEW BULLETIN DESCRIBING THE FINEST IN INDUSTRIAL FILTRATION.



PATENTS PENDING

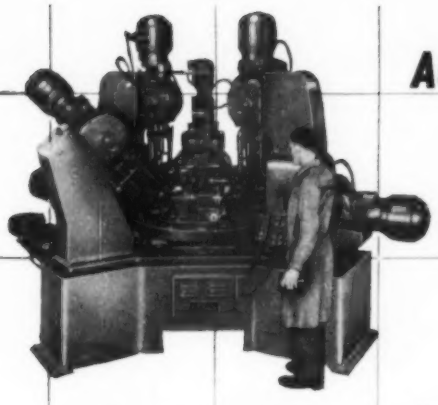
Delpark

INDUSTRIAL FILTRATION

Backed by More Than 30 Years Experience in Industrial Filtration

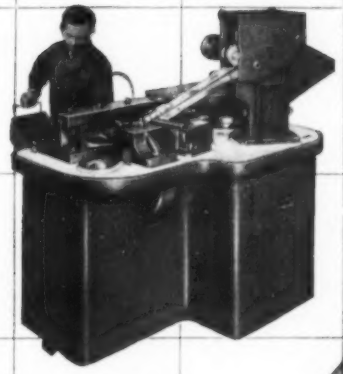
Visit our booth, Number 1830 at the Plant Maintenance Show, Cleveland, Ohio, January 19-22, 1953

INDUSTRIAL FILTRATION COMPANY LEBANON, INDIANA



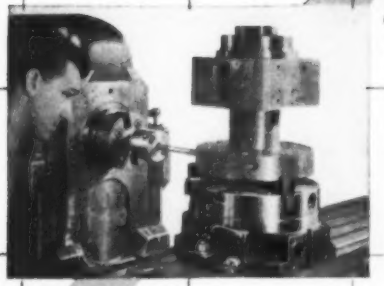
Automatic Drilling & Tapping Machines

Hartford Special single purpose drilling and tapping machines are built to provide the maximum in production efficiency with economy. Our customers include the leaders in every phase of American industry. Bulletin DM-100 furnishes specific examples.



Automatic Thread Rollers

For rolling machine screws, wood screws, drive screws, specials etc. Hartford Special makes two models to handle any requirements from ⅛" through 2½" thread length and .086 through .3125 in diameter. These machines have automatic feed, self-lubrication, rugged construction, plus other features which result in accurate high production. Ask for Bulletin.



Super-Spacers

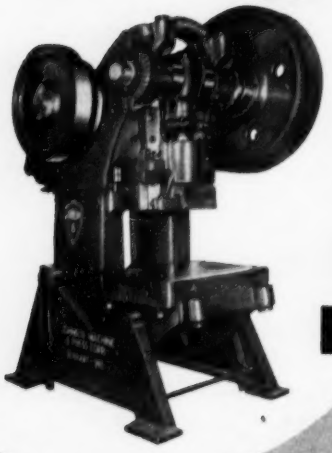
Hartford Special's world famous indexing fixture, the Super-Spacer, is available in two models with 8" or 12" capacity. The Super-Spacer speeds production and permits rigid control of accurate machining operations such as grinding, planing, slotting, drilling, milling, boring etc. New Bulletin gives complete details.

To up your production curve . . .

HARTFORD *Special*

THE HARTFORD SPECIAL MACHINERY CO. HARTFORD 12, CONN.

EXTRA SERVICE
EXTRA SAFETY
15 MODELS
16 to 90 Ton
JOHNSON Bonus Built POWER PRESSES

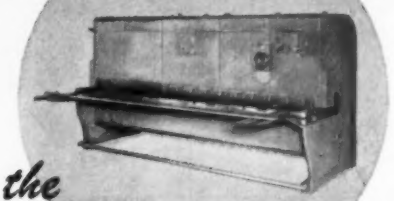


Will give more service for your production dollar because you can handle larger jobs on smaller presses.

RUGGED • DEPENDABLE • TIME-TESTED

Heavier construction, extra safety features, a list of satisfied users are reasons for an ever-increasing demand for Johnson presses. There's a press for your job, too. Write us today.

FAST, ACCURATE AND POWERFUL HYDRAULIC SHEARING IS HERE...
for mild steel up to 10 gauge



the HYDRA-SHEAR

The Hydra Shear surpasses all others in its field for smooth operation . . . no gears or clutch . . . less curl and burring . . . cannot be overloaded. Write for specifications.

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5 Important "ROCKWELL" Features

1. Totally enclosed, dirt and dust-proof "Zerominder" dial gauge. 2. Gripsel clamp screw for quick change and proper setting of penetrator. 3. All controls grouped conveniently. 4. Enclosed, easy-to-reach, variable speed dash pot. 5. Standardized weights. These features assure accuracy and ease of operation.

There are two models of WILSON "ROCKWELL" Hardness Testers, plus the TUKON for micro-indentation hardness testing. Write for information.

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WILSON "ROCKWELL" and TUKON Hardness Testers

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Willey's—The COMPLETE LINE of cutting tools—made complete in our own factories. Hundreds of standard sizes always in stock.

SPECIAL TOOLS

Excellent service on special tools built to your specifications.

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Aluminum screw machine stock from Reynolds offers definite cost reduction advantages over other metals. Thanks to aluminum's light weight, you get three times the number of pieces per pound . . . you cut your handling and shipping costs, too. Aluminum screw machine stock won't rust. And there's a wide range of natural and color anodized finishes that can be used.

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11S-T3—Free machining. Fine finishes at high speed. Free cutting, fine chips, good strength. Excellent for screw machine work. Longer tool life but slightly less strength than 17S-T4. Good formability of machined parts.

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61S-T6—Good corrosion resistance, weldability, strength. Lower machinability. Best formability and suited to electro-chemical finishes.

2S and 52S—Higher purity aluminum alloys available for special applications. Have good formability.

REYNOLDS METALS

REYNOLDS ALUMINUM

SEE YELLOW PAGES FOR NAME OF YOUR NEAREST REYNOLDS DISTRIBUTOR

HERE COMES HELP!

from your nearby Reynolds Aluminum distributor

Reynolds is putting forth every effort to ease your aluminum-buying problems. To meet the growing demand Reynolds Metals Company and other U. S. producers have already started on another vast expansion program which will greatly increase the country's aluminum production capacity.

To meet your immediate problems the nearby Reynolds distributor listed below is doing his level best to fill orders from limited stocks.

You can also count on his assistance and guidance in selecting temporary alternate materials. He will apply all of his experience and energy to helping you out. Present your procurement problems to him. Now as always he will give you the kind of service you need and want.

YOUR REYNOLDS DISTRIBUTOR IS LISTED BELOW

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Southern States Iron Roofing Co., Birmingham

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Bralco Metals, Inc., Los Angeles
Tay-Holbrook, Inc., San Francisco
Union Hardware & Metal Co., Los Angeles
United States Steel Supply Div., Los Angeles
Western Metal Supply Company, San Diego

COLORADO
Marsh Steel Corporation, Colorado Springs and Denver
Salt Lake Hardware Co., Grand Junction

CONNECTICUT
American Steel & Alloys Corp., Hartford

DISTRICT OF COLUMBIA
Lyon, Conklin & Co., Inc., Washington

FLORIDA
Horne-Wilson, Inc., Jacksonville, Miami, Orlando and Tampa
Southern States Iron Roofing Co., Jacksonville, Miami, Orlando and Tampa

GEORGIA
Southern States Iron Roofing Co., Albany, Atlanta, Augusta and Savannah

IDAHO
Salt Lake Hardware Co., Boise

ILLINOIS
J. G. Braun Co., (Architectural only) Chicago
Zinc Metals Corp., (Ingot Only) Chicago
United States Steel Supply Div., Chicago
Benjamin Wolff & Co., Chicago

INDIANA
Hubbell Metals Inc., Indianapolis

KENTUCKY
Southern States Iron Roofing Co., Louisville

LOUISIANA
Southern States Iron Roofing Co., New Orleans

MARYLAND
Clendenin Bros., Inc., Baltimore
Lyon, Conklin & Co., Inc., Baltimore

MASSACHUSETTS
Bay State Refining Co., (Ingot only) Chicopee Falls
Arthur C. Harvey Company, Boston
Pratt & Inman, (Wire, rod, bar, structurals) Worcester

MICHIGAN
Keefe Steel Corporation, Detroit
McDonnell Bros., Inc., (Architectural only) Detroit
Milton A. Meier Co., (Ingot only) Detroit and Grand Rapids

MINNESOTA
Vincent Brass & Copper Co., Minneapolis

MISSOURI
Hubbell Metals Inc., North Kansas City and St. Louis
Marsh Steel Corporation, North Kansas City

NEW JERSEY
Barth Smelting Corp., (Ingot only) Newark
Edgcomb Steel Corporation, Hillside

NEW YORK
Barth Smelting Corp., (Ingot only) Newark, N. J.
J. G. Braun Co., (Architectural only) New York
Edgcomb Steel Corporation, Hillside, N. J.
Rochester Smelting & Refining Co., (Ingot only) Rochester

NORTH CAROLINA
Southern States Iron Roofing Co., Raleigh

OHIO
The Atlas Metal Co., (Ingot only) Cleveland
G. A. Avril Smelting Corp., (Ingot only) Cincinnati
The Hamilton Steel Co., Cleveland
Natural Manufacturing & Supply Co., Cincinnati
Verys Brothers, Inc., Columbus

OKLAHOMA
Vinson Supply Co., Tulsa

OREGON
Woodbury & Company, Coos Bay, Eugene, Medford and Portland

PENNSYLVANIA
Atlas Steel Service Co., Philadelphia
Lavinson Steel Sales Company, Pittsburgh
Matthews & Evans Co., Philadelphia
Penn-Farrington Company, Philadelphia

SOUTH CAROLINA
Southern States Iron Roofing Co., Columbia

TENNESSEE
Southern States Iron Roofing Co., Memphis and Nashville

TEXAS
Moncrief-Lenoir Mfg. Co., Dallas, Harlingen, Houston, Lubbock, San Antonio and Temple
Vinson Supply Co., Dallas, Odessa and Snyder

UTAH
Salt Lake Hardware Co., Salt Lake City

VIRGINIA
Southern States Iron Roofing Co., Richmond

WASHINGTON
Joseph T. Ryerson & Son, Inc., Seattle and Spokane
Clingan & Fortier, Inc., Seattle

WISCONSIN
Benjamin Wolff & Co., Milwaukee

LOOK UNDER "ALUMINUM" IN YOUR CLASSIFIED TELEPHONE DIRECTORY

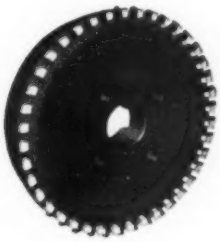
REYNOLDS METALS

REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

McCROSKY

COST CUTTING TOOLS



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Universal Line
MILLING CUTTERS

This new design, with the blade and wedge on radial center in the alloy steel body, provides space for 4 times as many blades as the cutter diameter, if extremely fine pitch is desired. Required hand and cutting angle is secured simply by inserting blades of proper design for the rotation desired and metal being cut. Thus, just one body is required for either left or right hand rotation, milling iron, steel or aluminum with carbide. Easy, accurate blade adjustment. Highly economical for long or short runs. Write for Bulletin.

McCROSKY
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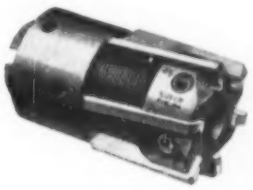

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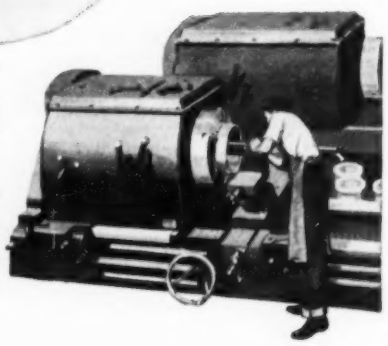

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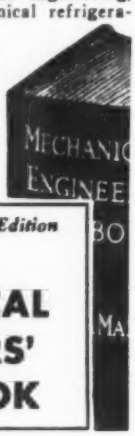

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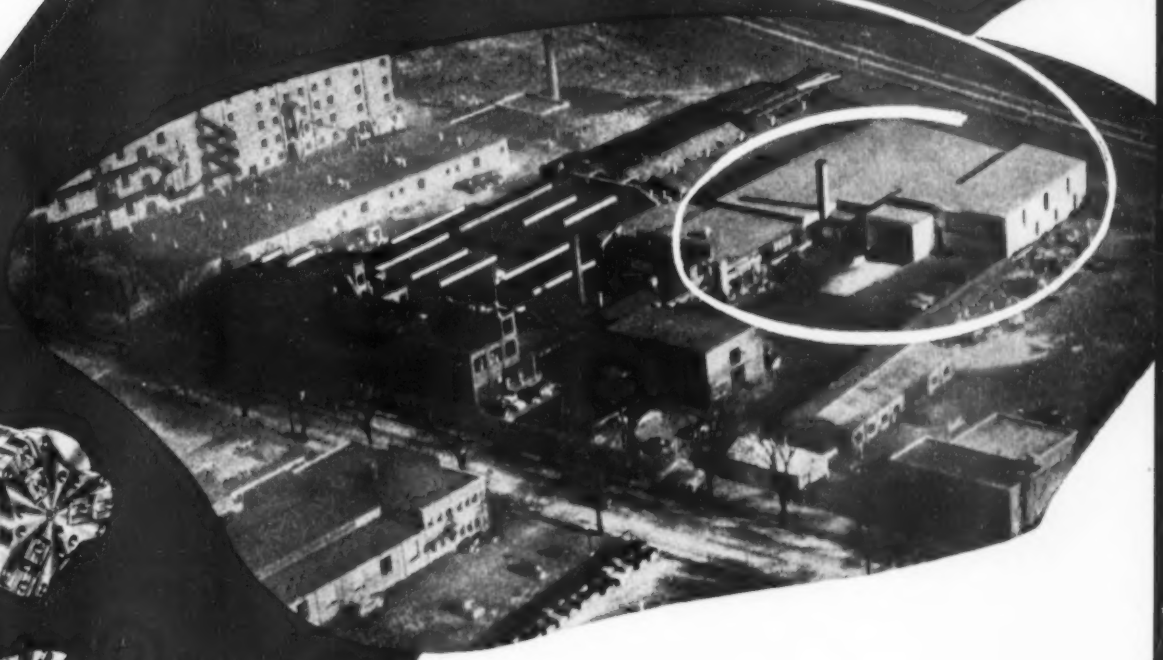

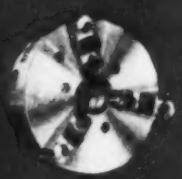

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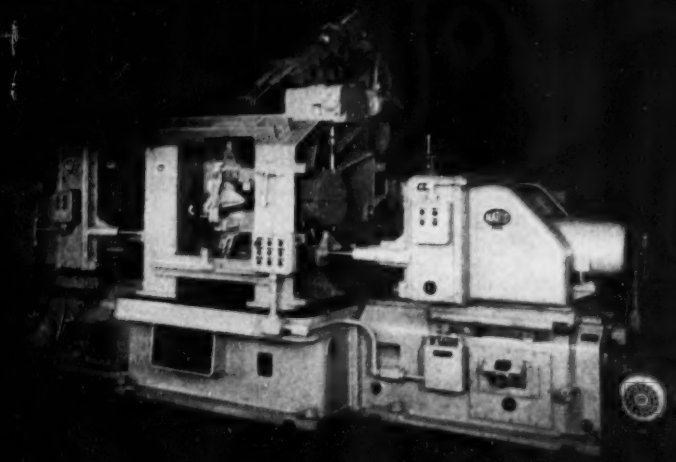

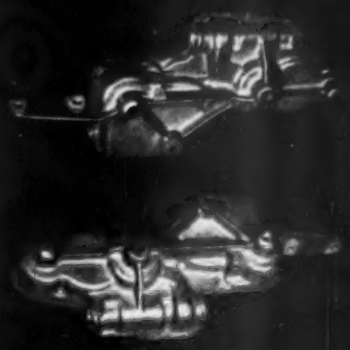

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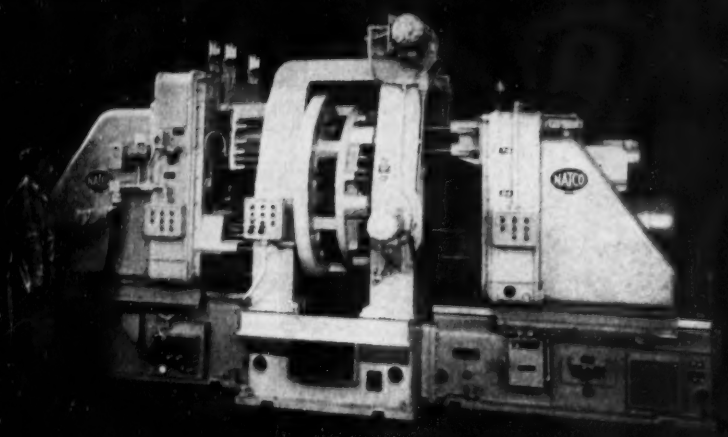

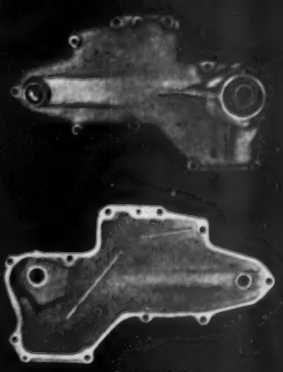

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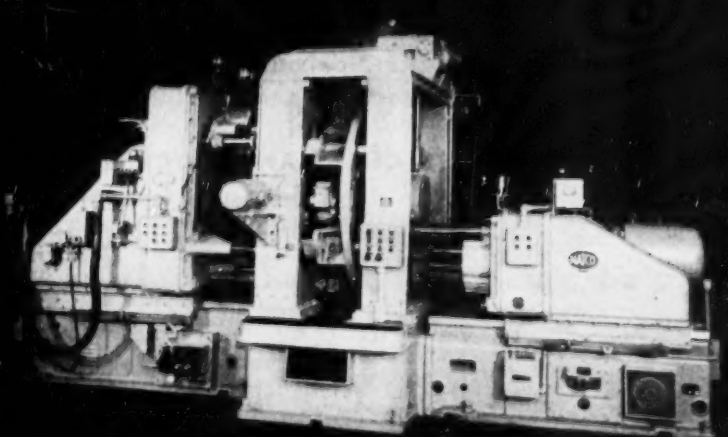

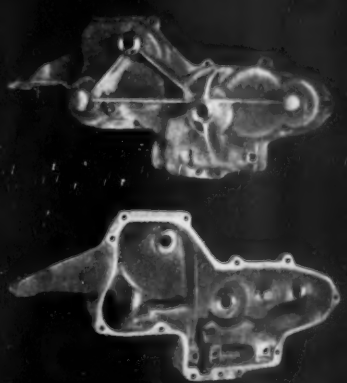

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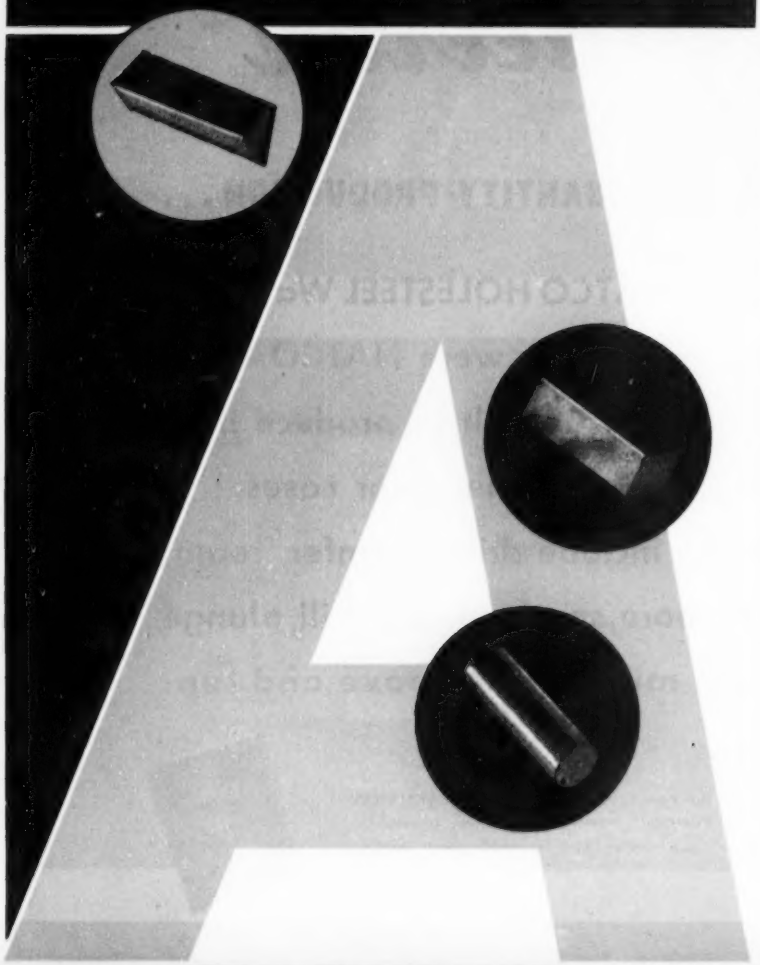

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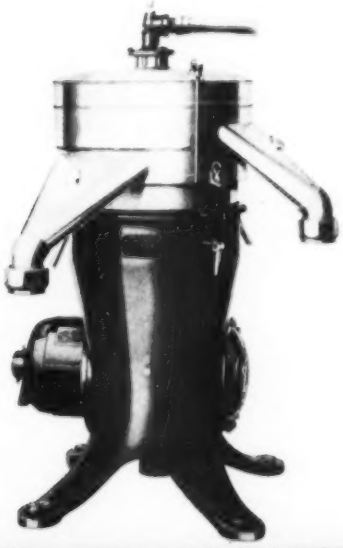

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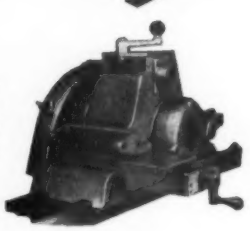

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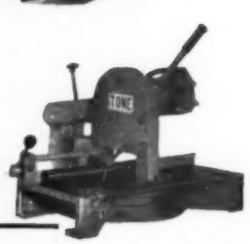

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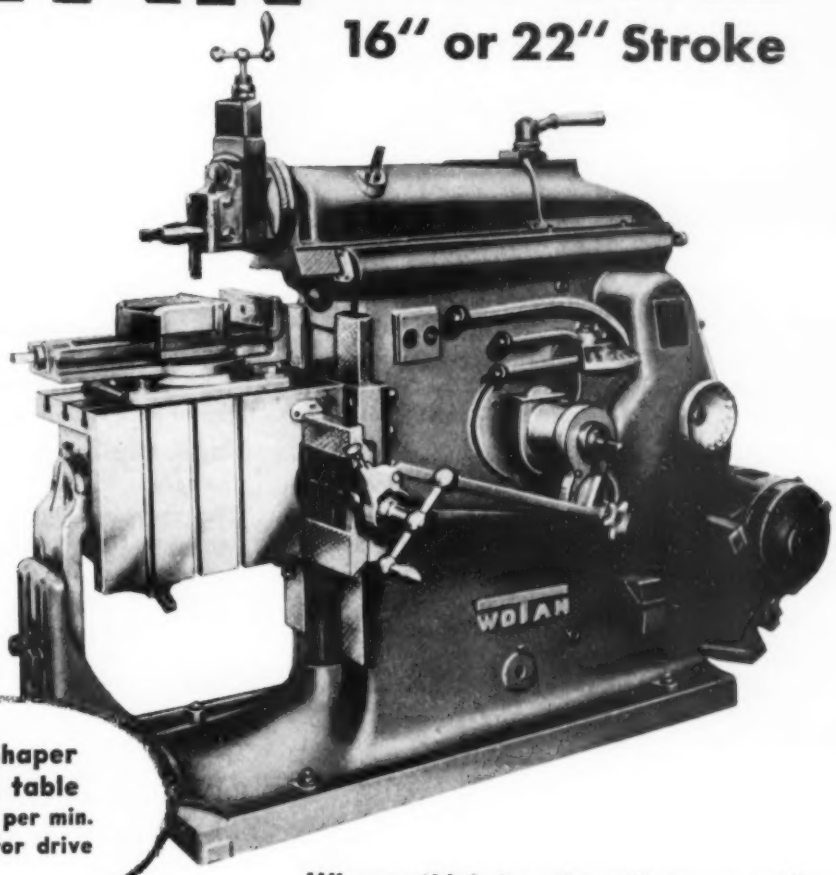

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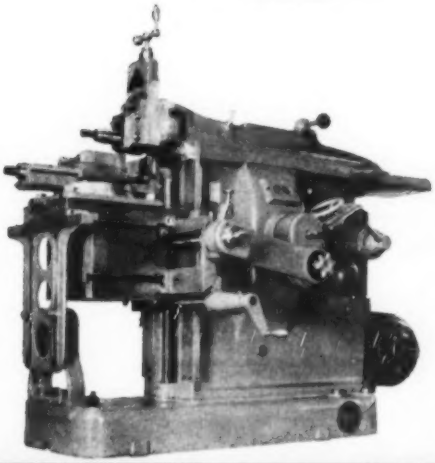

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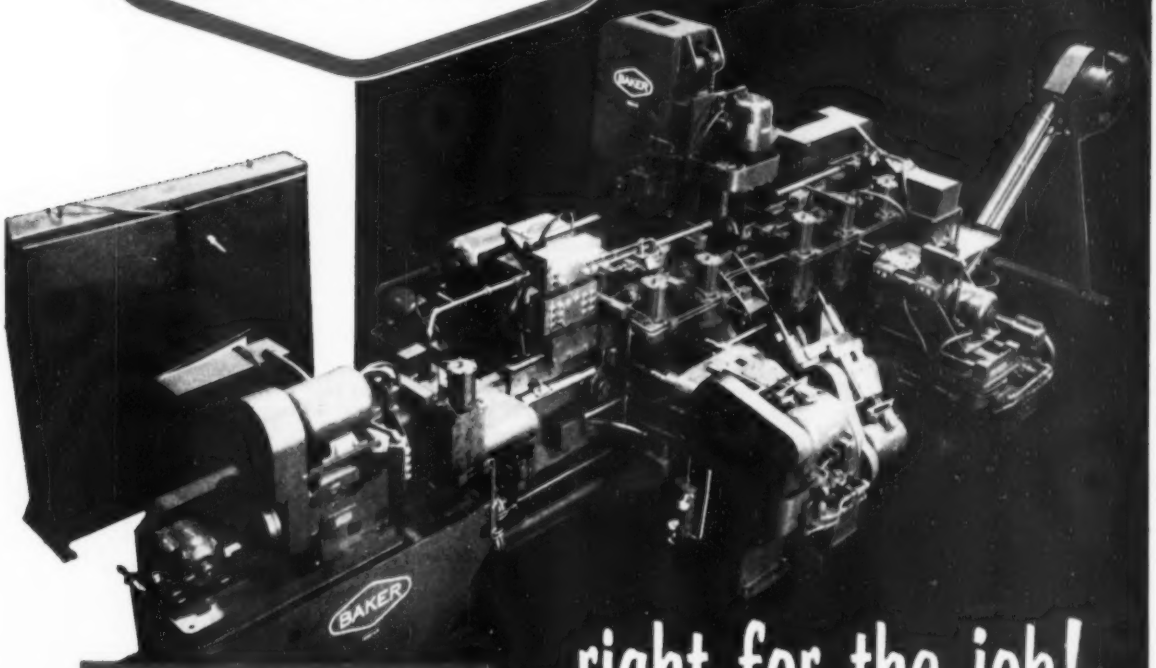

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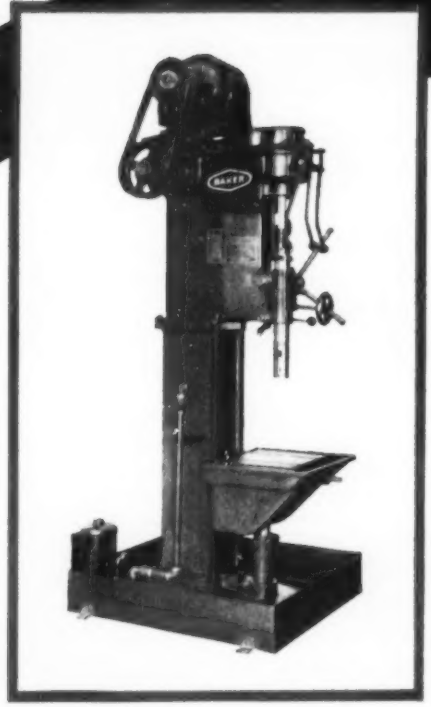

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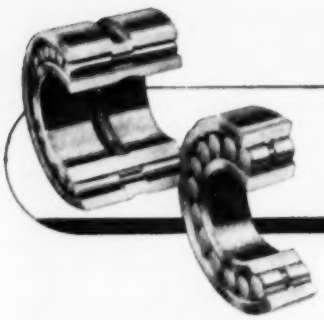


Over 33% Greater Capacity For The Same Size

There is a challenge facing manufacturers today to build smaller and more compact machines with extra precision and to combine more operations in each machine. This makes the selection of the proper bearings extremely important. A definite plus factor in this selection is the availability of a precision bearing that will deliver extra load carrying capacity in a minimum amount of space.

Obviously roller bearings, and particularly those of the small (needle) roller type occupy far less bearing space for equivalent capacity than ball bearings. Roller bearing capacity is built up in proportion to the effective race and roller contact provided. Thus a full type roller bearing *without space wasting cages* should provide the greatest capacity of any type of anti-friction bearing. However, to offer a perfect bearing the resulting full roller complement must be prevented from skewing and binding where misalignment occurs in the application.

The Guiderol bearing is the accepted answer to all these requirements considering precision, load capacity, long life, versatility of mounting, and ease of lubrication. Published ratings show the Guiderol CT Series bearing has over 33% greater load carrying capacity than the average of the four highest rated interchangeable bearings.* As a result, a Guiderol bearing at least one size smaller can often be substituted with the necessary shaft and housing requirements reduced in size and cost.

Bearing	McGill Guiderol No. GRI-209	Brand A Bearing	Brand B Bearing	Brand C Bearing	Brand D Bearing
Published Load Rating	8370 lbs.	6700 lbs.	7000 lbs.	5520 lbs.	6080 lbs.

Capacities at 2500 hours average life at 100 RPM

How Rollers Are Guided

In the Guiderol bearing design the grooved rollers with full race width contact are prevented from skewing by a center guide rail. Normally the rollers run on a true axis

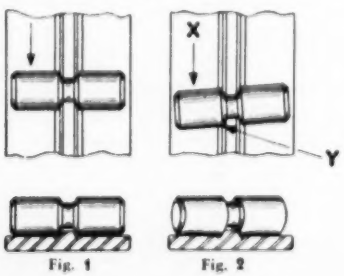
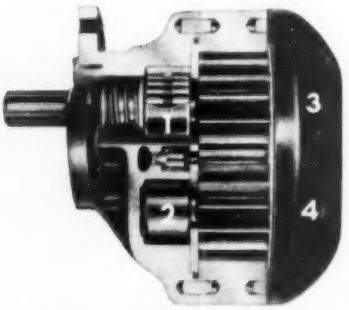


Fig. 1 Fig. 2

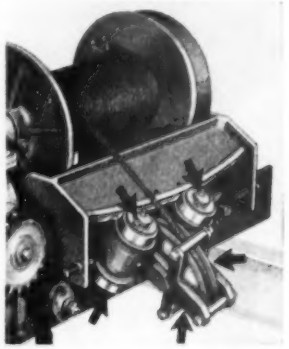
— not contacting the rail and thus need no correcting. (Fig. 1) Should misalignment cause a shift off center (Fig. 2) the leading end of the roller is retarded by contact with the rail at location Y. The trailing end catches up, relieving the rail contact, and the roller then resumes normal operation.

Typical GUIDEROL® Bearing Mountings

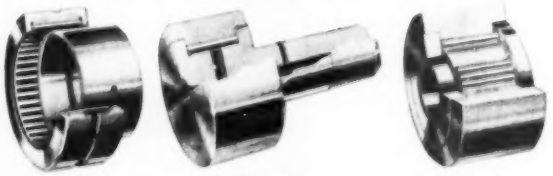


On a Hydreco Gear Pump Idler and Drive Shaft, 4 Guiderol bearings are used. The longer rollers of the Guiderol bearings are effective virtually to the edge of the races. This gives substantial support close to the gear and materially reduces shaft deflection.

Four Guiderol bearings support and guide an automatic spooling attachment across the face of the reel track on a 20,000 pound Gar Wood Reel-Lite Winch. The guided roller principle prevents skewing of rollers in the 4 vertically mounted bearings even with a 10,000 pound angular load per bearing. A fifth Guiderol bearing in the sheave provides added stability and eliminates binding due to off-center loading.



MULTIROL® Bearings



SE Series CF Series CYR Series

A new 140-page Bearing Reference Guide complete with 30 pages of vital engineering data has just been released by the McGill Manufacturing Company.

It has the full story on the advantages of Guiderol Bearings and in addition contains complete information on the well-known Multirol CF, CYR and SE Bearings. *Send now for your copy of the McGill Catalog No. 52.*

McGILL® — Precision Bearings

McGILL MANUFACTURING COMPANY, INC.
300 N. Lafayette Street, Valparaiso, Indiana

Looking for something special?

J&L provides you with Cold Finished Steel that's—

CARBON RESTORED . . . ANNEALED
NORMALIZED . . . BRIGHT ANNEALED

Our cold finishing bar mills now include a modern controlled atmosphere furnace for the thermal treatment of cold finished steel. This latest addition to Jones & Laughlin Steel Corporation facilities can mean cash in the till for *you* . . . cash that's measured in terms of cold finished bars that lower production costs, increase output and assure top-flight quality in the finished products you are producing.

Why not get in touch with J&L *today*? We'll be glad to provide detailed information relating to your specific needs. Our contact metallurgists are available to work *with* you to determine how *you* can use these special J&L cold finished steels to gain the advantages of improved machinability, exact mechanical properties, increased ductility, or elimination of the necessity to remove "decarbed" surfaces.

JONES & LAUGHLIN STEEL CORPORATION, PITTSBURGH, PA.

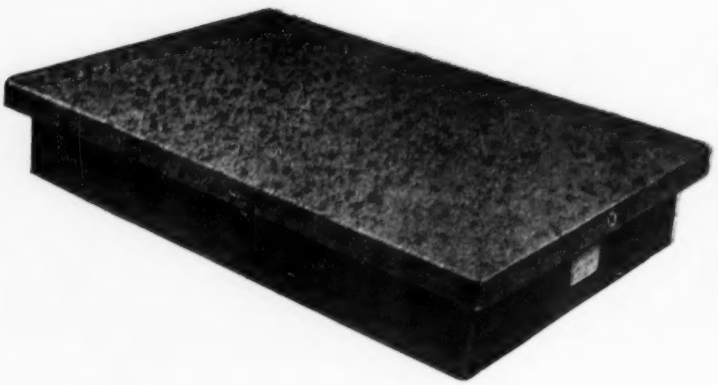
Jones & Laughlin Steel Corporation
402 Gateway Center, Pittsburgh 30, Pa.

☐ Without obligation please send me your booklet "Extra Services to Users of Cold Finished Steel."
☐ Please have your representative call.

Name _____
Title _____
Company _____
Address _____

PIONEERS IN PRECISION

WHAT YOU SHOULD KNOW ABOUT



GRANITE SURFACE PLATES

HERMAN STONE . . .
FIRST in granite surface plates

FIRST *Herman Stone produced the FIRST granite surface plate in 1941.*

FIRST *Herman Stone was the FIRST to use selected grey granite for surface plates.*

FIRST *Herman Stone was the FIRST to use PINK granite for surface plates of extreme accuracy.*

85% of ALL granite surface plates in use today were produced by Herman Stone—and 75% of ALL Herman Stone surface plates have been produced from PINK granite. Where required, Herman Stone GREY granite surface plates provide an economical basis for precision measurement operations.

Producers of the FIRST—and the FINEST —granite surface plates

• The first granite surface plate was produced from a solid block of specially selected granite in 1941, by The Herman Stone Co. Since that time, the preference for granite surface plates, over ordinary metal plates, has continually increased.

This preference has been due to the many exclusive characteristics, inherent in granite, which offer exceptional advantages in precision measurement operations. For example,

HERMAN STONE PINK GRANITE SURFACE PLATES

WILL NOT WARP—they are sawed from huge blocks of granite which has no internal strain as is present in cast metals.

WILL NOT RUST—dirt, oil, filings and other foreign matter which may collect on the surface are easily wiped off, without affecting the accuracy of the plate.

PROVIDE SMOOTH ACTION—the natural pores in precision-produced granite surface plates provide the needed break in the air seal to insure free, smooth action of gages.

ARE TEMPERATURE-RESISTANT—co-efficient of expansion is extremely low; ordinary temperature changes and body heat do not affect accuracy.

ARE NON-ABRASIVE, NON-MAGNETIC—they cannot become impregnated with grit; it is not necessary to de-magnetize any materials before testing.

INSURE PERMANENT ACCURACY—the ageless permanence of granite, plus tolerances as low as .00005", insure maximum accuracy.

SALES OFFICES: 504 Hamlet Bldg. • Dayton 2, Ohio

The Herman Stone Co.

Telephone: Fulton 2731

Ask ALCOA about threading and tapping aluminum screw machine stock

Cutting threads in aluminum is easy if you follow simple procedures of alloy selection, tool preparation and machine setup.

Where possible, use a die head with adjustable chasers rather than a solid die. Spiral taps are preferred to straight fluted taps, especially for deep-hole tapping operations.

Taps and dies remove a large amount of metal in proportion to their size. To reduce the load, have the blank or hole diameter of the part near the tolerance limit favoring the removal of the least amount of metal.

Both taps and dies should have a top rake angle ground on the leading edge of the tool. On some jobs, both taps and dies will cut better if a hook is ground along the leading edge of the lands to the third full thread, at about 5° to the axis of the tap or chaser. Tap flutes should be highly polished. Tap lands should be relatively narrow to reduce friction between the tool and the work.

Your local Alcoa sales engineer will gladly answer your questions on machining, alloy selection and finishing. You'll find him listed under "Aluminum" in the classified phone book.

ALCOA OFFERS TWO BOOKS— *Alcoa Aluminum in Automatic Screw Machines*—a 95-page book containing information on tool design, setup and operating techniques. *Corrected Tool Diameter Tables*—a 64-page book giving corrected tool diameters for circular form tools and flat form tools under conditions of 0°, 5° and 10° top rake.

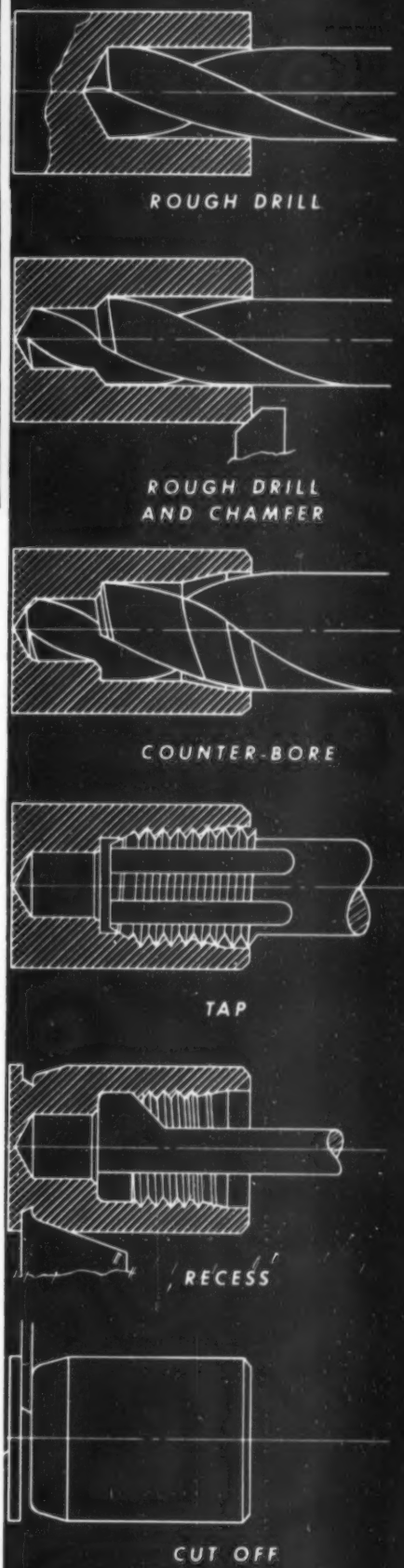
ALUMINUM COMPANY OF AMERICA
871-A Alcoa Building • Pittsburgh 19, Pennsylvania

BASIC ECONOMICS FOR BUYERS

While you buy screw machine stock by the pound, you machine it by the foot. A pound of aluminum gives you three times more feet of stock than a pound of brass or steel.

Alcoa Aluminum

ALUMINUM COMPANY OF AMERICA

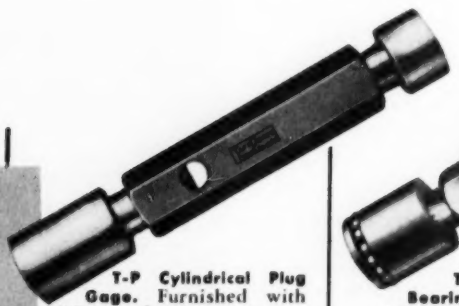


TIPS FROM TAFT-PEIRCE ON:

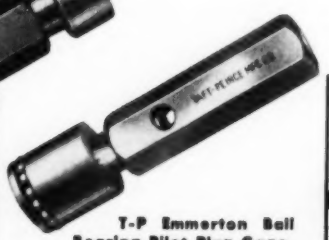
Selecting a FIXED GAGE

The *best* gage for most jobs provides the *best* combination of speed, wear-resistance, upkeep, and initial cost. When it comes to Fixed Gages, here are some comparisons that will help you make your selection.

Plain Plugs



T-P Cylindrical Plug Gage. Furnished with "Go" and "Not Go" separately, or on opposite ends of handle. Progressive gage — with "Go" and "Not Go" on same end increases speed.



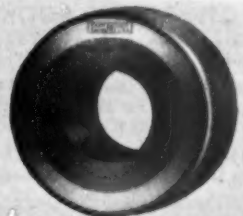
T-P Emmerton Ball Bearing Pilot Plug Gage. Guides gage into alignment. Won't jam. Eliminates end-wear, or burring — valuable on soft metals. Gages faster, lasts longer.

T-P Carbide, Norbide, and Chromium Plated Plugs. For exceptional resistance to abrasion or scratching. Maximum wear-life. Brittleness requires care in handling.

Plain Rings

T-P External Ring Gage. For reference purposes, setting air or other variable gages and accurate size control of parts.

T-P Chromium-Plated Ring. Lowers gaging costs on longer runs of highly abrasive materials or hardened steel. Provides up to 5 times more service.



T-P Norbide and Carbide Rings. For greatest wear-resistance. Available in Norbide and Tantalum or Tungsten Carbide. Brittleness requires careful handling.

THE TAFT-PEIRCE
WOONSOCKET,

Adjustable Snaps

T-P Plain Adjustable Snap Gages. Available with gaging pins, round or square buttons, and solid anvils in combination with buttons.

T-P Midget Snap Gages. Smaller in size and section, their light weight aids in gaging small or delicate parts. Maximum rigidity and stability are provided.

T-P Cemented Carbide or Norbide Snaps. For close tolerance work on abrasive materials. Gaging members tipped with Tungsten or Tantalum Carbide. Or with Norbide inserts, as shown.

Thread Plugs

T-P Limit Thread Plug Gage. Available in Taper Lock or Trilock design. Taper Lock up to 1.510". Reversible from No. 0 to ½". Reversible Trilock above 1.510".

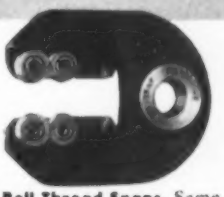
T-P Carbide Thread Plug Gage. For longer wear. Furnished both standard and special from #8 machine screw size up.

T-P Truncated Thread Set Plug Gage. Sets and checks thread gages with greater accuracy. Checks thread angle and O. D. Indicates wear, or oversize.

Thread Rings & Snaps

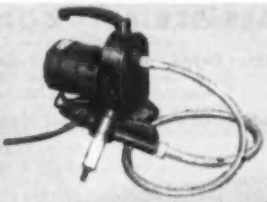
T-P Thread Ring Gages. Single unit clamping device simplifies setting, increases accuracy, eliminates distortion. Locks without changing pressure on ring.

T-P Adjustable Thread Snaps. Faster than ring gaging, and just as accurate, they check lead, angle, and all other thread elements. Variable pitch diameter.



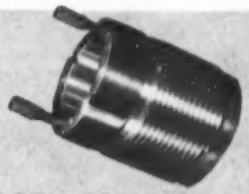
T-P Roll Thread Snaps. Same as Adjustable, with *rolls* for gaging members. Since gaging members rotate, wear is spread over greater surface and service life increased.

Special Gages



T-P Rotocheck. Fastest thread gaging method. Push — and the gage screws into the work. Release the pressure and it stops. Pull—and it disengages.

T-P Spline Gages. A special gage due to the diversity of individual requirements. Thousands of such special gages are made at Taft-Peirce every year.



T-P Thread Concentricity Gage. Checks size and location of internal threads. Another example of infinite variety of fixed gages made by T-P.

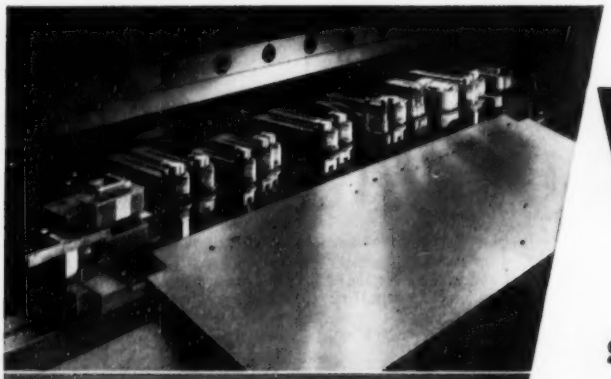
Gage Blocks

T-P Gage Blocks. For the ultimate in accuracy. Measures increments down to 0.00005". Available in small or large sets, or individually. Carbide Wear Blocks also available.

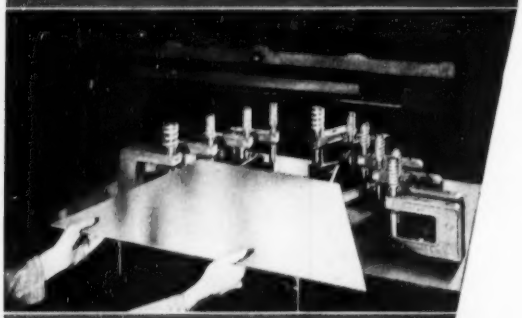
MANUFACTURING COMPANY
RHODE ISLAND

T-P means Top Precision

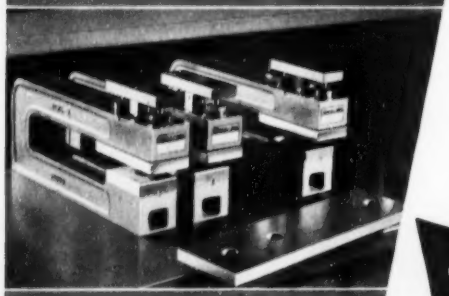
For the complete story on these items, and many more, get your copy of the new Taft-Peirce Handbook.



Showing Wales Type "BL" Hole Punching and Type "N" Notching Units in a combination press brake setup for punching and notching mild steel up to 1/8" THICK.



A stamping press setup of Wales Type "CJ" Hole Punching Units for punching mild steel up to 1/4" THICK.



Showing a setup of Wales Type "HS" Hole Punching Units in a press brake for punching mild steel up to 3/4" THICK.

Showing a setup of Wales Type "NJ" Notching Units in a stamping press for notching mild steel up to 1/4" THICK.

PUNCHING 1/8", 1/4" AND 3/4" THICK METAL ?

standardize on

WALES

Hole Punching Units

Only Wales Hole Punching and Notching Units provide the numerous *patented features* plus the *time and cost saving advantages* that have made it "standard practice" with thousands of metal fabricators to *standardize* on this *exclusive* equipment.

Wales independent, self-contained Units eliminate costly, single-purpose custom dies, reduce expensive setup time and practically eliminate press "downtime."

The same group of Wales Units may be interchangeably set up in stamping presses and press brakes. In many cases, setups of Wales Units are in production the same day a hole punching pattern is released by your engineering department.

The multiple advantages of Wales Hole Punching and Notching Equipment are too MANY to tell here, so write for fully-illustrated, functionally colored catalogs TODAY.

WALES-STRIPPIT CORPORATION

George F. Wales, *Chairman*

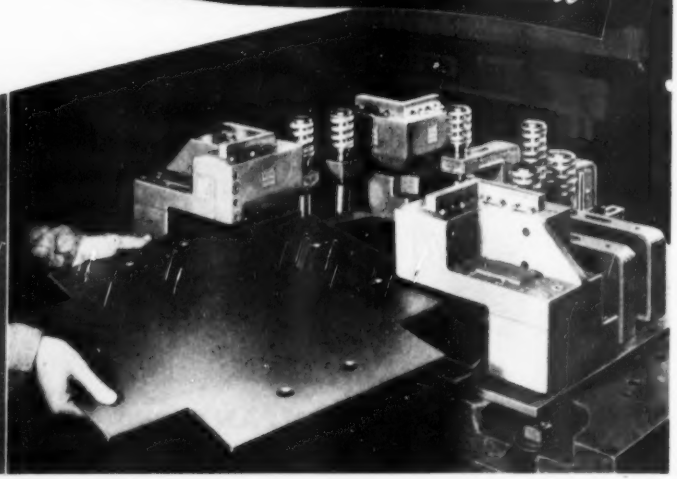
373 **Payne Avenue, North Tonawanda, N. Y.**

(Between Buffalo and Niagara Falls)

Wales-Strippit of Canada, Ltd., Hamilton, Ontario

Specialists in Punching and Notching Equipment

also notching up to 1/4" thick metal



"no more GAMBLING on tool steel selection"

[½ actual size; Selector is in 3 colors]

That's what one of the thousands of pleased users says about his CRUCIBLE TOOL STEEL SELECTOR, the new, simple, handy method of picking the right steel, *right* from the start. Since Crucible announced this Selector two years ago, thousands of tool steel users have received their Selectors . . . and here's what some of them say—

"Handiest selector I've ever seen!"

"Saves me time and headaches"

"It's so logical—you begin with the application".

You can be sure the answer you get with your Crucible Tool Steel Selector will be just right in every case, for this Selector covers 22 tool steels which fit 98% of all tool steel applications. And when—with a flip of the round dial—you get the answer, you'll get the steel FAST, too, because all the tool steels on the Selector are right in stock, in all our 26 conveniently-located warehouses.

This Selector is bound to be a big help to you—so write for yours today. There is no obligation whatsoever. Just fill in the coupon and mail now . . . before you turn this page and forget! CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, New York.

Here's how it works:

To use the Selector, all you need know is the characteristics that come with the job: type and condition of material to be worked, the number of pieces to be produced, the method of working, and the condition of the equipment to be used.

FOUR STEPS—and you've got the right answer!

1. Move arrow to major class covering application
2. Select sub-group which best fits application
3. Note major tool characteristics (under arrow) and other characteristics in cut-outs for each grade in sub-group
4. Select tool steel indicated

That's all there is to it!

Here's an example:

Application—Deep drawing die for steel

Major Class—Metal Forming—Cold

Sub-Group—Special Purpose

Tool Characteristics—Wear Resistance

Tool Steel—Airdi 150

One turn of the dial does it!

And you're sure you're right!

Crucible Steel Company of America
Dept. A, Chrysler Building, 405 Lexington Avenue
New York 17, N. Y.
Gentlemen:
Sure! I want my free CRUCIBLE TOOL STEEL SELECTOR!
Name_____ Title_____
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CRUCIBLE first name in special purpose steels

TOOL STEELS

52 years of Fine steelmaking

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Beaver TOOLS ARE WORKIN' FOOLS!

The Beaver system of Quick-Change Tool Holders and Adaptors will enable you to do a better job —quicker and more economically—with every milling and boring machine in your shop.

Beaver Quick-Change Tool Holders and Adaptors give you complete interchange of tooling. Not just for one machine but for any machine equipped with a precision-made Beaver Holder.

Tool changes can be made in a jiffy! No knock-out—no realignment—NO DOWNTIME! Just a twist of the cam-ring and the next tool is locked accurately in position, saving untold hours of production time.

Beaver Quick-Change tooling has been proved "right" by every-day use in hundreds of plants for over a decade.

Treat your plant to the best! Switch to Beaver Quick-Change tooling today and join the impressive list of Beaver-tooled plants.

For complete details ask for our catalog #52.

Beaver TOOL AND ENGINEERING CORPORATION

2850 ROCHESTER ROAD • BOX 429, ROYAL OAK, MICHIGAN

For copper in any form – For top-notch service – Call Chase

What kind of copper or copper alloy do you need? Free-cutting brass rod? Sheet and strip brass? Phosphor bronze for springs? Call your nearby Chase warehouse. We can supply you, subject to government controls, with the widest variety of brass or copper materials for production, maintenance or repair.

Many of our branches are equipped to slit, saw, or shear our metals or your own stocks to specifications.

Chase BRASS & COPPER

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

• *The Nation's Headquarters for Brass & Copper*

Albany†	Cincinnati	Houston†	Minneapolis	Pittsburgh	Seattle
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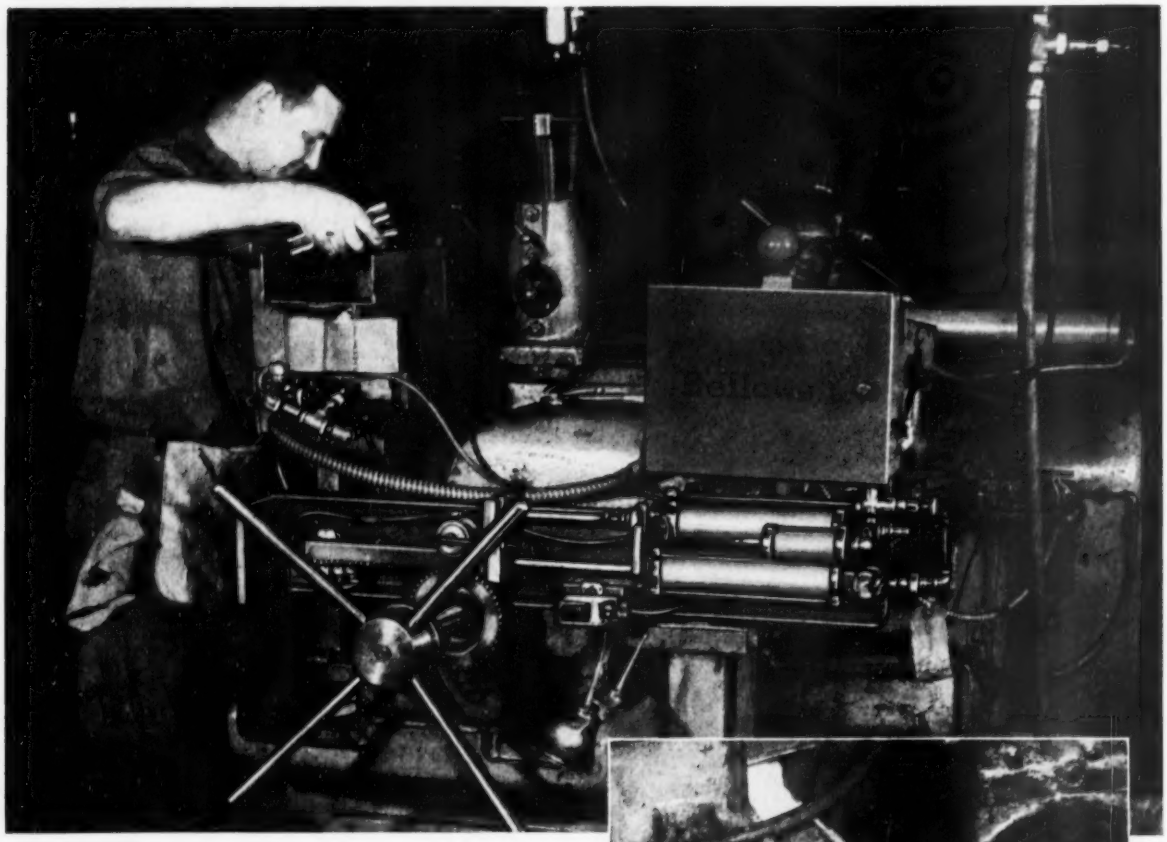
Baltimore	Dallas	Kansas City, Mo.	New Orleans	Rochester †	
Boston	Denver†	Los Angeles	New York	St. Louis	(† sales office
Chicago	Detroit	Milwaukee	Philadelphia	San Francisco	only)

Deliveries to your factory by truck, rail or express, if desired.

Close tolerance sawing, slitting, shearing to your specifications.

Stocks of tube, rod, bar, strip, sheet and wire in a variety of alloys.

AIR-POWERED INFEED GIVES 43% MORE PRODUCTION— BETTER QUALITY CONTROL—IN CENTERLESS GRINDING



CENTERLESS grinding is a critical operation. Infeeding by hand requires a keen eye, a sure touch, and an instinctive sense that comes only with years. Scrap runs high at best — and production . . . well you take what you get, and try to be happy about it.

But better production is possible. Try infeeding with Bellows "Controlled-Air-Power" and watch scrap drop. Add an air-powered work positioner and ejector and watch production rise. Put on a hopper feed, and see production jump as much as 40%.

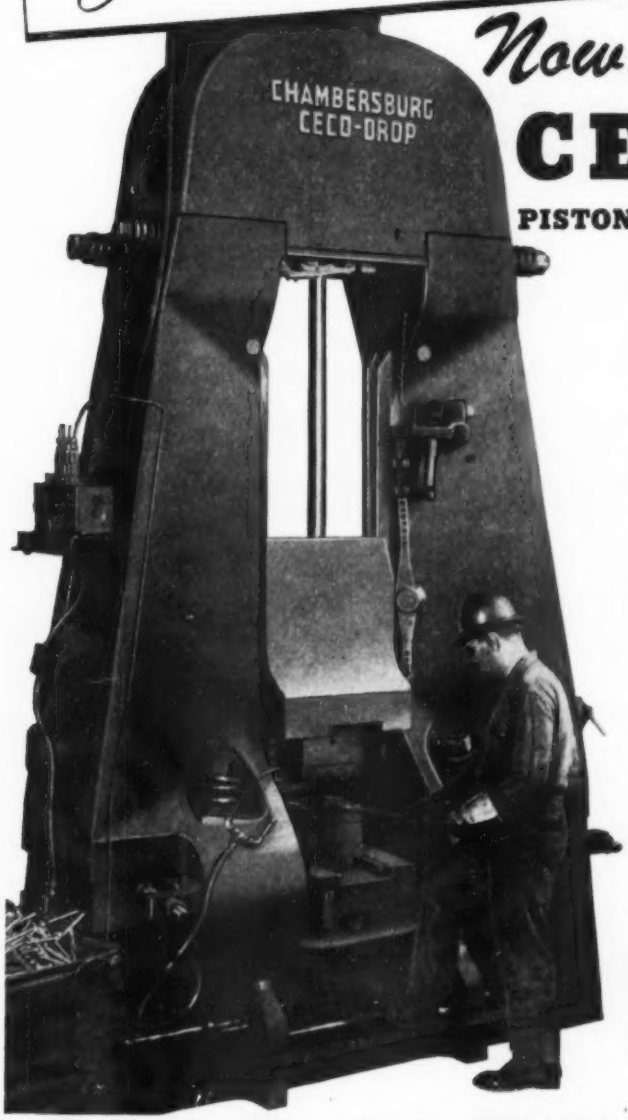
We'd like to tell you more about Bellows "Controlled-Air-Power" and what it is accomplishing in setting new production records for centerless grinders . . . and for drill presses, milling machines and other machine tools.

The Bellows Co.
AKRON, OHIO

Production in grinding a 57/64" diameter, 7" long counter gear shaft for the transmission of one of America's best known cars jumped 43% when Bellows "Controlled-Air-Power" went on the job. Scrap dropped to a new low. Operator fatigue was no longer a factor. (Protective covers removed for photograph.)

WITH COMPETITION GETTING KEENER—

Down Time becomes more costly!



Now is the time to ask about the

CECO-DROP

PISTON-LIFT, GRAVITY DROP HAMMERS

High labor costs, high material costs can only be offset by increased production per machine. If your board drop hammers are showing signs of use, more and more time and expense is necessary for board replacement, adjustments and repairs; don't wait—investigate CECO-DROP piston-lift, gravity drop hammers now. (Especially consider the fact that Ceco-Drop upper works can probably be installed on your present board drop hammer anvils.)

CECO-DROP HAMMERS are the result of more than a half century of experience in the manufacture and design of hammers. They cost less to operate. There are no board changes, no friction adjustments, and lubrication is automatic. Treadling the Ceco-Drop is easy and not fatiguing, and die alignment is held. The unique stroke adjustment and short stroke control afford a wide range of operation.

Write today for information about Ceco-Drop Hammers. Ask for Bulletin 11-L-0. You'll be glad you did.

CHAMBERSBURG ENGINEERING COMPANY, CHAMBERSBURG, PA.

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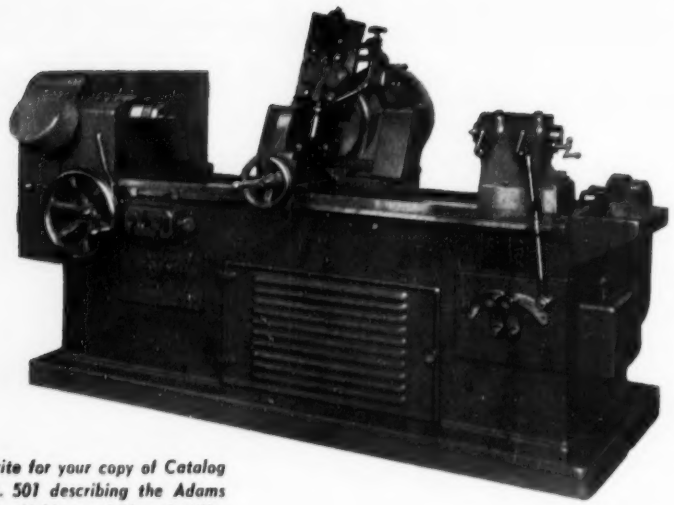
THE HAMMER BUILDERS



SEVERAL MACHINES
AVAILABLE FOR
QUICK DELIVERY
GET YOURS NOW!

The Adams Gear Hobber & Thread Miller

Write for your copy of Catalog No. 501 describing the Adams Gear Hobber and Thread Miller and the Adams Manufacturing Hobber.

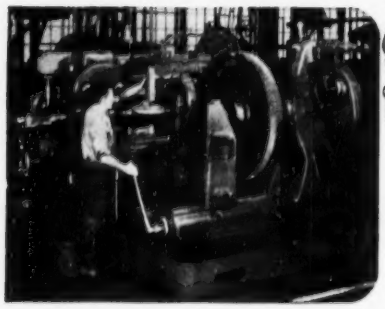
Here is a machine of multiple uses, as it is designed to hob spur gears, multiple splined shafts and helical gears, in addition to milling worm and screw threads. It combines the precision and productivity of a limited purpose machine with the flexibility and range of a general purpose tool.

Write for complete details.
THE ADAMS COMPANY, 1905 Bridge St., Dubuque, Iowa.

The ADAMS Company, Dubuque, Iowa, U.S.A.

HOBBER AND THREAD MILLER . . . MANUFACTURING HOBBER . . .

A New Arrival-



. . to help make BETTER GEARS!

This 18 ton Herringbone Continuous-tooth Generator, handling gears and pinions up to 60" PD, 2 DP, is a recent addition to Stahl's modern equipment. Stahl skill and experience, plus the finest precision machines, assure accurate, durable gears in all sizes. For the economical answer to any gear problem get a Stahl estimate first.

SPURS TO 72" PD, 1 DP
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SPIRAL, HELICAL and WORM GEARS TO 48" PD, 2 DP
CONTINUOUS-TOOTH HERRINGBONE TO 60" PD, 2 DP
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25th Year of Continuous
GEAR *Production*
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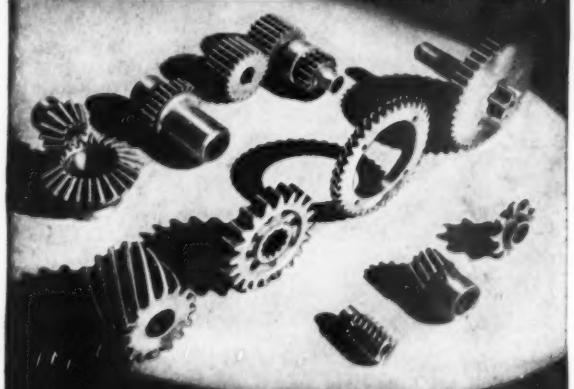

A complete plant equipped with over one hundred major machine tools for gear production.

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ACME GEAR COMPANY
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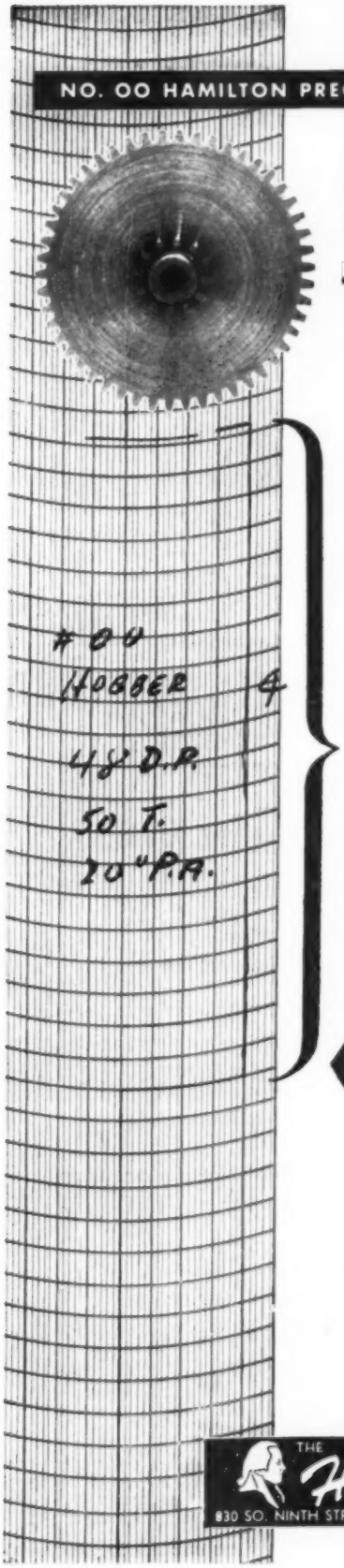
NO. OO HAMILTON PRECISION SMALL GEAR HOBBER

less THAN .0001" COMPOSITE error

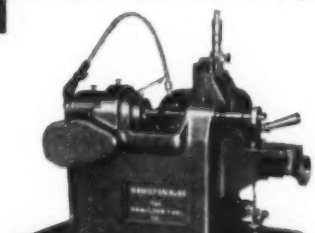


Spur gear: brass: 48 diametral pitch: 50 teeth: 20° pressure angle: less than .0001" composite error: generated on Hamilton No. 00 Precision Gear Hobber.

DEMANDS for mechanical accuracy become more and more insistent as new and improved designs reach production. And machine tools, purchased without consideration for future accuracy requirements, become obsolete before they are depreciated.

Protect your investment in gear generating equipment. Buy the one small gear hobber which is precise enough to meet future requirements, and rigid enough to hold its precision. Buy Hamilton!

ACTUAL TEST *(see illustration on left) made before secondary operation. Heavy lines equal .001" — light lines equal .0002". Gear made .004" undersize to allow for secondary operation.*



Get the full story! Write for free Bulletin No. 5234 today.

THE Hamilton TOOL COMPANY
830 SO. NINTH STREET • HAMILTON • OHIO • U • S • A

AND...

A recent test of the

HAMILTON NO. 1 GEAR HOBBER

★

Made at the request of a potential purchaser, the purpose of the test was to determine whether Hamilton equipment could equal the accuracy and production of the gear hobbing equipment then in use, which was considered satisfactory.

Using a special hob arbor, or work holding fixture, the equipment which the manufacturer had been using for gear generation produced 4.8 gears per hour, 25/40 micro inch finish.

★

HAMILTON NO. 1 GEAR HOBBER

(using standard hob arbor)

TEST RUN NO. 1
10 gears per hour, 15 micro inch finish

TEST RUN NO. 2
12 gears per hour, 20 micro inch finish

TEST RUN NO. 3
15 gears per hour, 25 micro inch finish

★

IT follows, of course, that the manufacturer who requested this test is now a user of the Hamilton No. 1 Gear Hobber.

★

Time after time after time, we have proved to interested production officials that the Hamilton line of precision small gear hobbers will produce required accuracy with increased production . . . or equal present production with increased accuracy. Ask for our bulletin No. 5240.

THE HAMILTON TOOL CO.
830 S. NINTH STREET
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Stub Length Double-End End Mills

Stock Items

This line of small size end mills, in both double-end and single-end, with flutes shorter than regular, provides the following advantages:

GREATER STRENGTH
LONGER TOOL LIFE
FAR LESS BREAKAGE
FASTER FEEDS

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The Modern Way

Illustration shows typical set-up for cutting taper keyways with table tilted.

Machines are made in three sizes for keyways 1/16" to 1" in width.

Great simplicity and ease of operation of Davis Keyseaters assure the user of accurate, time saving work.

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Any Quantity—Any Material

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PREVENTS INJURY — SAVES GLOVE COSTS

Feeds ferrous, non-ferrous strip or sheet . . . faster, safer. Use for stamping, shearing. Right or left hand non-slip fitted grip, self-adjusting. Sturdy, hardened work surfaces. FULLY GUARANTEED. *Write today. Early delivery.*

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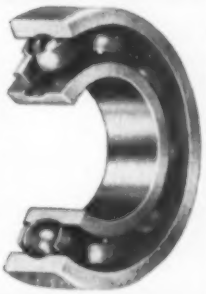
NICE

Announces New Lines!

PRODUCT DESIGNERS will be interested in these new "cost saving" additions to the NICE Line. FOR COMPLETE INFORMATION WRITE FOR CATALOG NO. 150.

"C" SERIES GROUND RADIAL BEARINGS
SOLID RACE TYPE WITH BALL RETAINER

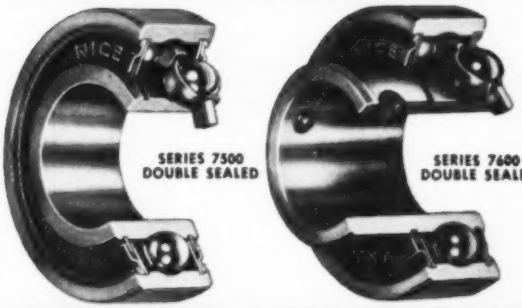
The new NICE "C" series are precision radial bearings made in inch dimensions which correspond to established light duty inch standard sizes. Produced with ground and polished race ways and assembled with chrome alloy balls, they are designed for light duty radial, thrust or combined load applications and speeds in the neighborhood of 5000 R.P.M. maximum. "C" series radials are available without shields, single shielded or double shielded.



"FR" SERIES GROUND THRUST BEARINGS
FLAT BALL RACES WITH BALL RETAINER

"FR" series flat race thrust bearings conform to established inch standard sizes and are recommended for light loads and speeds up to 2500 R.P.M. The ball cages are made from solid brass stock for durability and long life and the ball track surfaces are precision ground to a high finish.

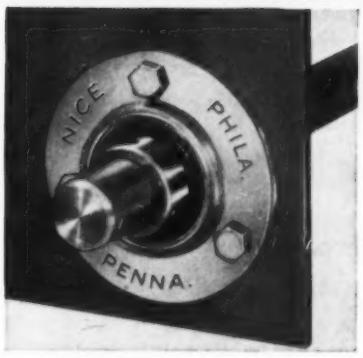
7500 AND 7600 SERIES GROUND RADIAL BEARINGS
SOLID RACE TYPE WITH BALL RETAINER-LABYRINTH COMPOSITION SEALED



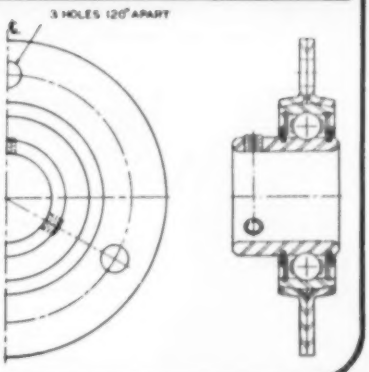
Series 7500 and 7600 bearings are recommended for applications requiring the accuracy of rotation and quiet performance of close limit precision bearings, and where a highly efficient seal is required to retain lubricant and exclude foreign materials. They are designed for medium loads and speeds in the neighborhood of 5000 R.P.M. maximum, and are made in inch standard sizes. Normally double sealed, series 7500 and 7600 bearings can be produced to order with seals on one side only or without seals.

SEAL DETAIL
An oil resistant synthetic rubber coated fabric ring fits into a groove in the inner race and the recess formed by the inner and outer dust caps.

FLANGE MOUNTED SELF-ALIGNING RADIAL BEARINGS
LABYRINTH COMPOSITION SEALED-TWO LOCKING SET SCREWS



NICE series F100 flange mounted radial bearings are designed for easy application to machine frames. The self-aligning feature together with their highly efficient labyrinth composition seal (see detail above), makes them ideal for a wide variety of applications such as farm machinery, conveyors, power transmissions, blower and fan installations. They are available in popular inch shaft sizes and are recommended for medium load and speed service conditions.



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3. Rigid Headstock for vibrationless operation
4. Built-in quick travel
5. Inclined table surface provides maximum rigidity
6. Noiseless precision drive gear unit

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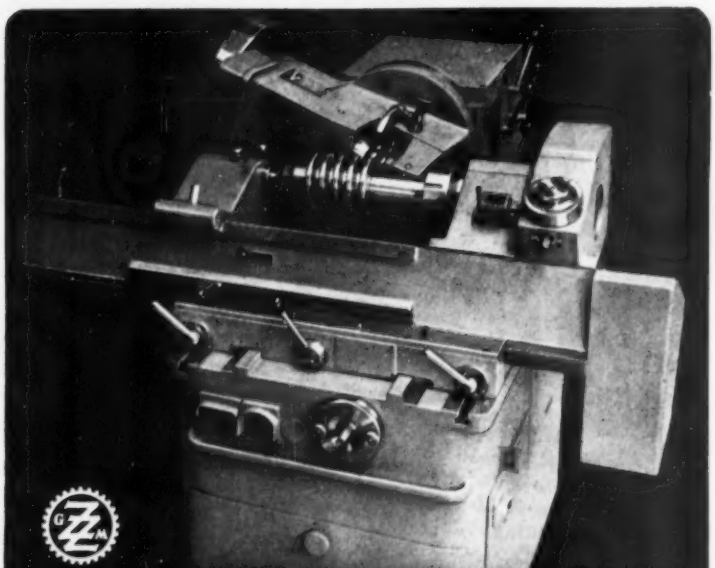
Max. Worm Diam.	10⅛ in.
Max. Work Length	28¾ in.
Max. Milling Length	20½ in.
Smallest Base Diam. of Worm	25/64 in.
Bore in Indexing Head	3-15/64 in.
Max. Helix Angle R.H. Worms	90°
L.H. Worms	30°

We exhibit International Machine Tool Exhibition, Olympia—London, Stand No. 34, Grand Hall Annex. 2nd European Machine Tool Exhibition, Hanover, Stand No. 1131, Hall 1.



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The cylindrical plungers in the Waltham Sub-Presses slide in babbitted bearings. This bearing is tapered on the outside and can be forced downwards, thus reducing the inside diameter to fit the plunger when the latter becomes worn through use. Exact alignment and constant precision can be maintained throughout the life of the die. Write for information about the nine sizes.

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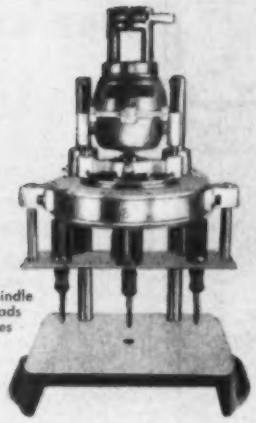

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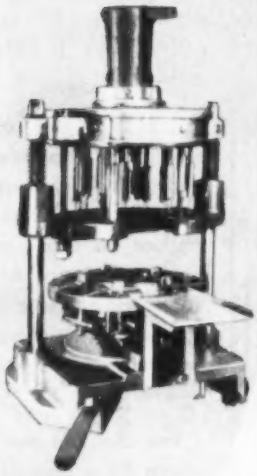

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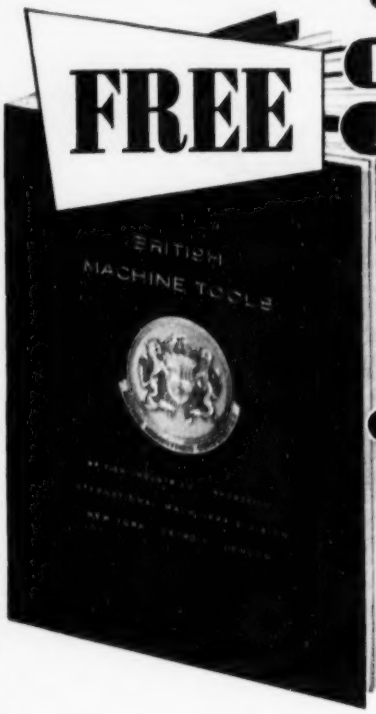

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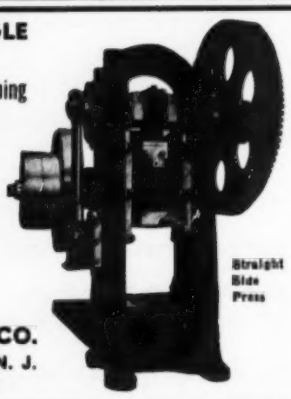

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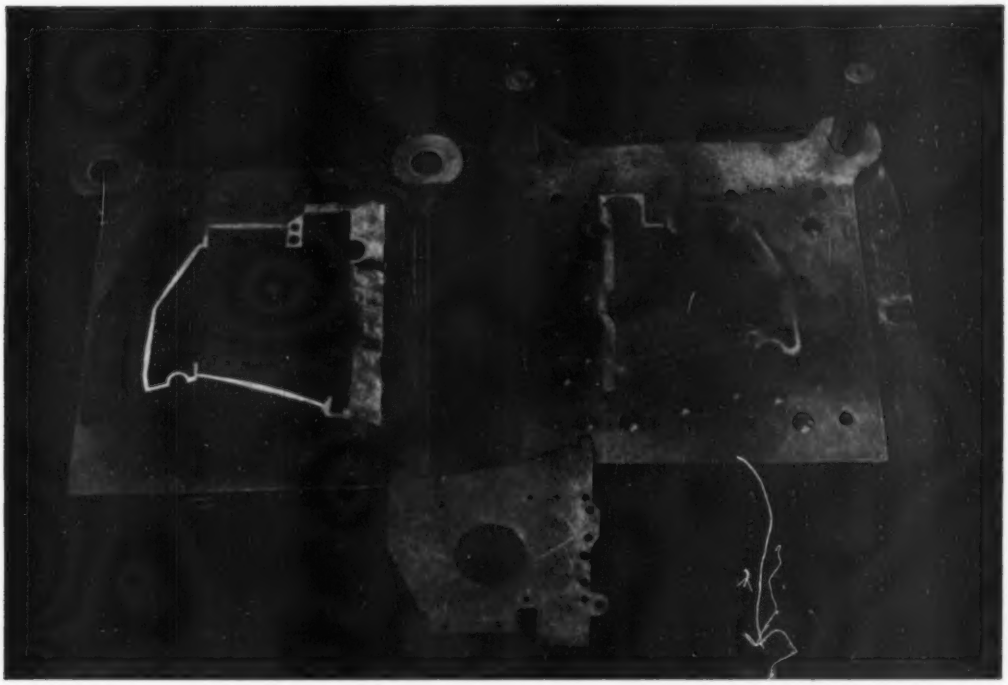

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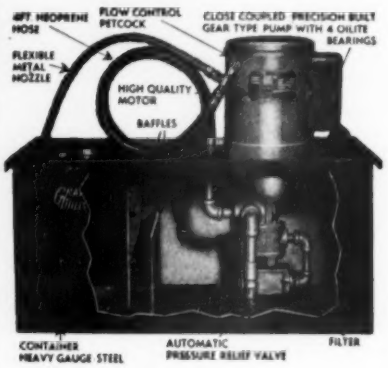

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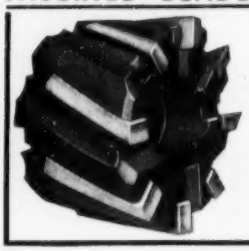

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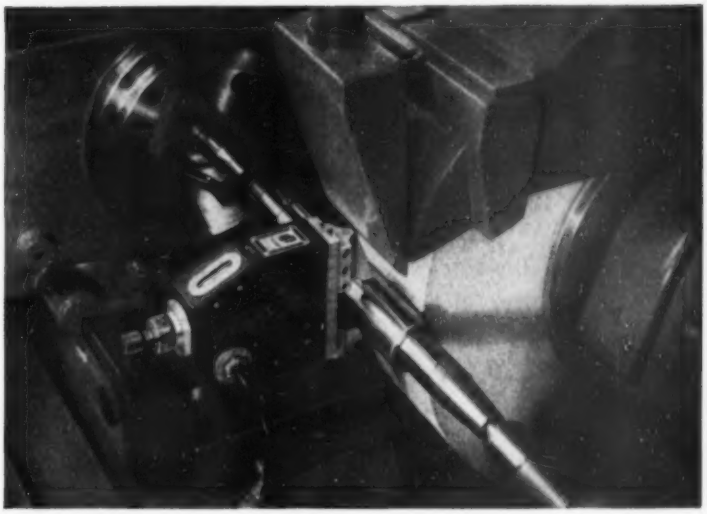

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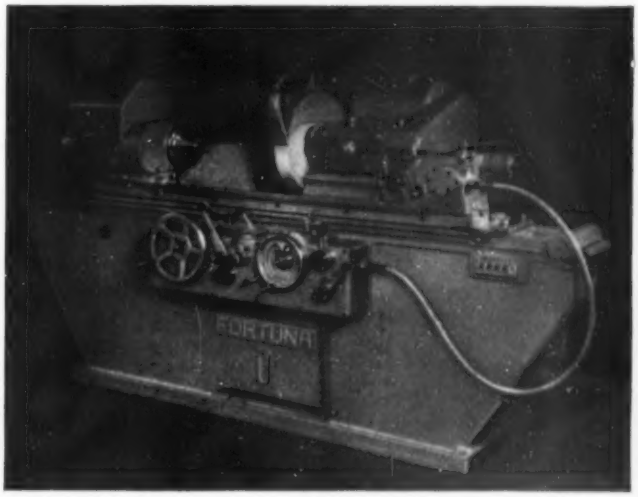

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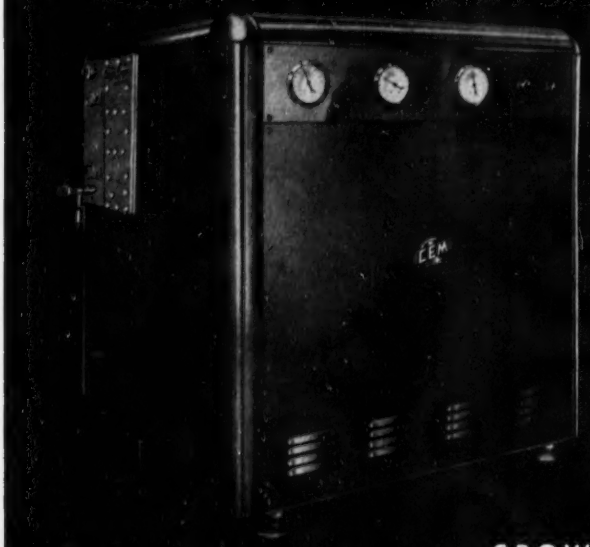

Cooling the liquids used in many industrial operations cuts costs . . . increases production . . . improves product quality and gives longer tool life. The Cem Oil Cooler will control the temperature of industrial liquids of all types—cutting oils or fluids, quenching liquids, hydraulic oils, etc.

DOUBLE-DUTY
Because it has two separate cooling lines, this unit can be used on two operations at the same time, even though two different liquids are being used.

CAPACITY RATING
Cools cutting oil at the rate of 200 gallons per hour for two drilling operations at the same time. Capacity on other operations in proportion, depending on working conditions.

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In use for more than two years on a variety of industrial operations. Also in our own machine plant under the critical observation of our own engineers.

NON-CORROSIVE
Cooling lines made entirely of stainless steel tubing. There is no danger of contaminating the liquid.

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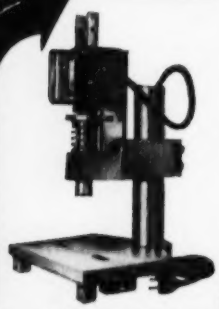

PRODUCES UP TO 10,000 PIECES PER HR.

This versatile low cost electric impact hammer produces up to 10,000 pieces per hour using automatic switching—as high as 5,000 pieces per hour with hand or foot switching. Ideal for steel stamping, inspection or identification marks on small defense parts.
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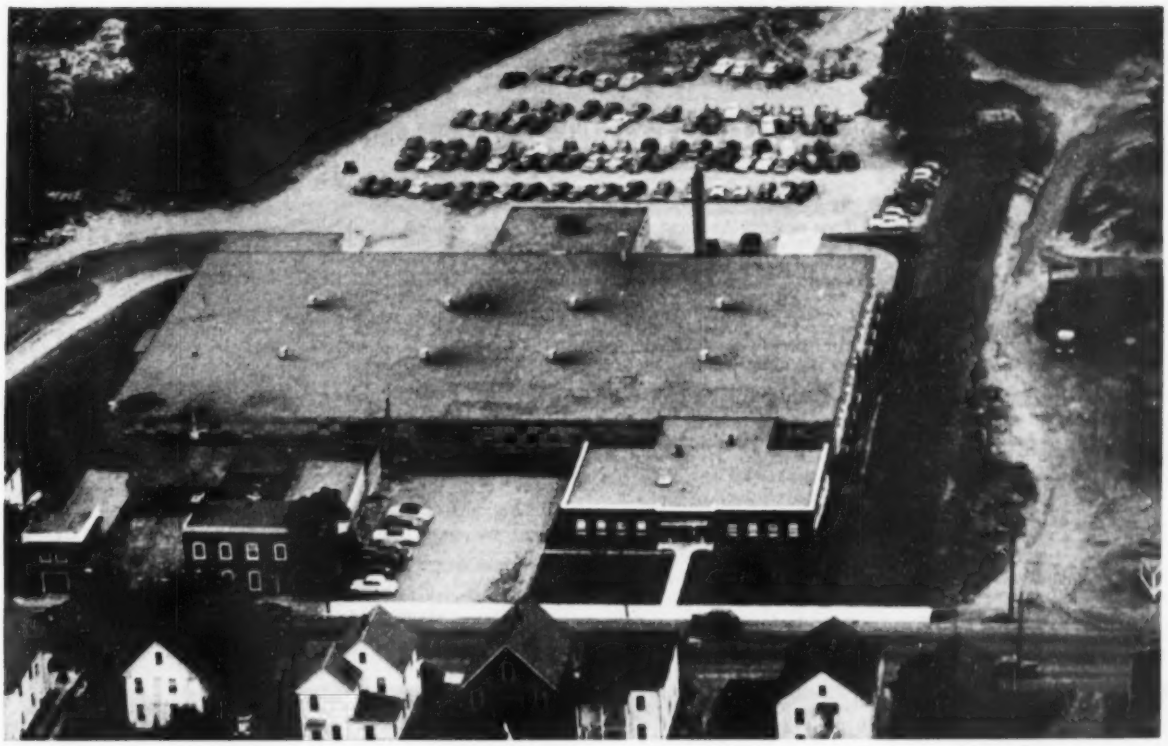

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Only 22 years ago . . . back in 1931 . . . the first BRIDGEPORT High Speed Milling Attachment was delivered. Tremendous acceptance greeted this Attachment, so much so that it became necessary to produce a complete machine. . . . The BRIDGEPORT TURRET MILLING MACHINE which was introduced in September, 1938. Since then, more than 16,000 "Bridgeport Millers" have followed this first one into the shops of the metal working industry. Then, too, an ever-increasing line of accessories has been developed and delivered to extend the utility of these popular machines.

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Tool life greatly increased by reconditioning cutting oil *with*
BARRETT OIL EXTRACTION SYSTEMS

Reports from plants using Barrett Oil Recovery and Reconditioning Systems show surprisingly high percentages in increased tool life. Then, too, users are enthusiastic as to the improved condition of the reclaimed oil as well as the high returns on the investment. Some set-ups in plants engaged on defense production have paid for themselves in a few months.

The Barrett Centrifugal Oil Extractor—which is part of a complete system—recovers 100% of the removable oil or 98½% of the contained oil from chips and turnings in 2 minutes or less. Complete Barrett oil recovery and reconditioning systems include Extraction, Sterilization and Sedimentation, together with filtration. The units involved are available in various sizes, individually or as a group, and are available with full manual control, semi-automatic control or with full automatic control requiring only loading, unloading, starting and stopping of the extractor by the operator. Complete plans including storage tanks for reclaimed oil or for use in conjunction with existing equipment are also available.

With the Barrett system, abrasive-free oil assuring longer tool life can always be depended on. With Barrett Sterilization and Sedimentation equipment, cutting oil is also safe and free from contamination.

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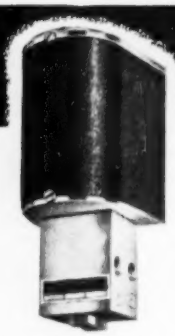

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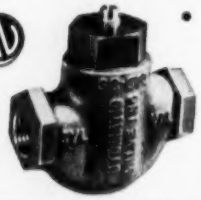

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Sizes ¼" — ⅜" ½" and ¾"
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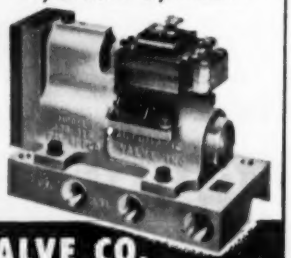

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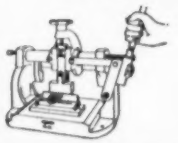

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Test head removable for testing large parts—castings, forgings, etc.
Equally accurate as portable or stationary equipment.
Can be used in any position—even upside down.

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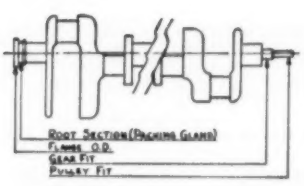
Salvage of rejects speeded by new metallizing alloy

outwears old bearing material 25 times

Automotive manufacturer replaces chrome plating installation with metallizing for salvage of mis-machined crankshafts; steps up output to 10 per hour

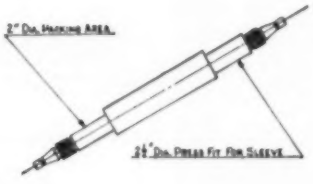
Sprabond Wire, the new self-bonding metallizing alloy, is speeding reject salvage in a wide range of production applications. It has been found particularly valuable in building up parts which have been machined undersize, or damaged by tool marks. Resulting surfaces are extremely hard and, due to their microscopic pore structure, tend to hold considerable amounts of oil. These factors produce excellent wear characteristics, some users reporting increases in service life as much as 25 times that obtained in any other way.

Application is simple and fast; only 3 operations: (1) the part is cleaned or undercut; (2) Sprabond Wire applied; (3) the surface finish-ground. Dovetailing and undercutting often not required and build-up can be carried to a feather edge. No danger of warpage because negligible heat is generated in the part during spraying.



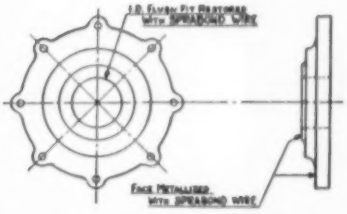
Better and faster than plating

Sketch shows automotive crankshaft of the type being reclaimed in quantity by large manufacturer. These parts were formerly reclaimed by plating, which was slow and expensive. With metallizing, however, production rate is 10 shafts per hour.



Where welding is impractical

Heat warping and consequent straightening costs made welding impractical for salvage of blower shafts such as shown above. Shafts formerly scrapped and replaced are now rebuilt. With Sprabond Wire metallizing, saving is $45.00 each.

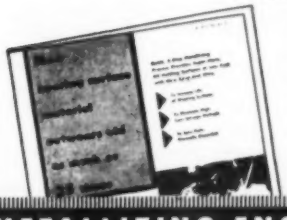


Fits restored—no re-machining

Press fit in electric motor end bell is frequently lost through wear. Welding is impractical here, too, because of warpage. But a few thousandths of Sprabond Wire on the I.D. builds a press fit so that even minimum grinding is often unnecessary. Savings per end bell—about $30.00.

Some other money-saving applications for the Sprabond Wire process

Cracked blocks and castings — flat surfaces — molds, patterns, match plates — sand holes thin sections — lathe ways—inside diameters — gas holes.



FREE BULLETIN Metco Bulletin 57B describes the advantages of the Sprabond Wire metallizing process in detail. *Micro*-photograph of Sprabond Wire coating on steel shows how it works. Use the coupon to send for your free copy today. No obligation, of course.

METALLIZING ENGINEERING CO., INC.
38-24 30TH STREET — LONG ISLAND CITY 1, N. Y.
In Great Britain: METALLIZING EQUIPMENT COMPANY, LTD. Chobham near Woking, England

The following trade names are the property of Metallizing Engineering Co., Inc.: METCO®, SPRABOND WIRE. ®Reg. U. S. Pat. Off.

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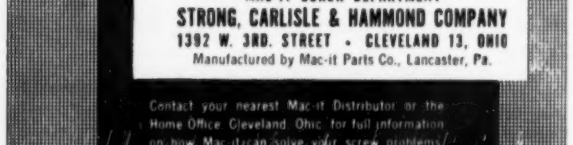

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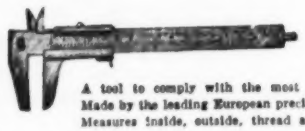

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With set screw			
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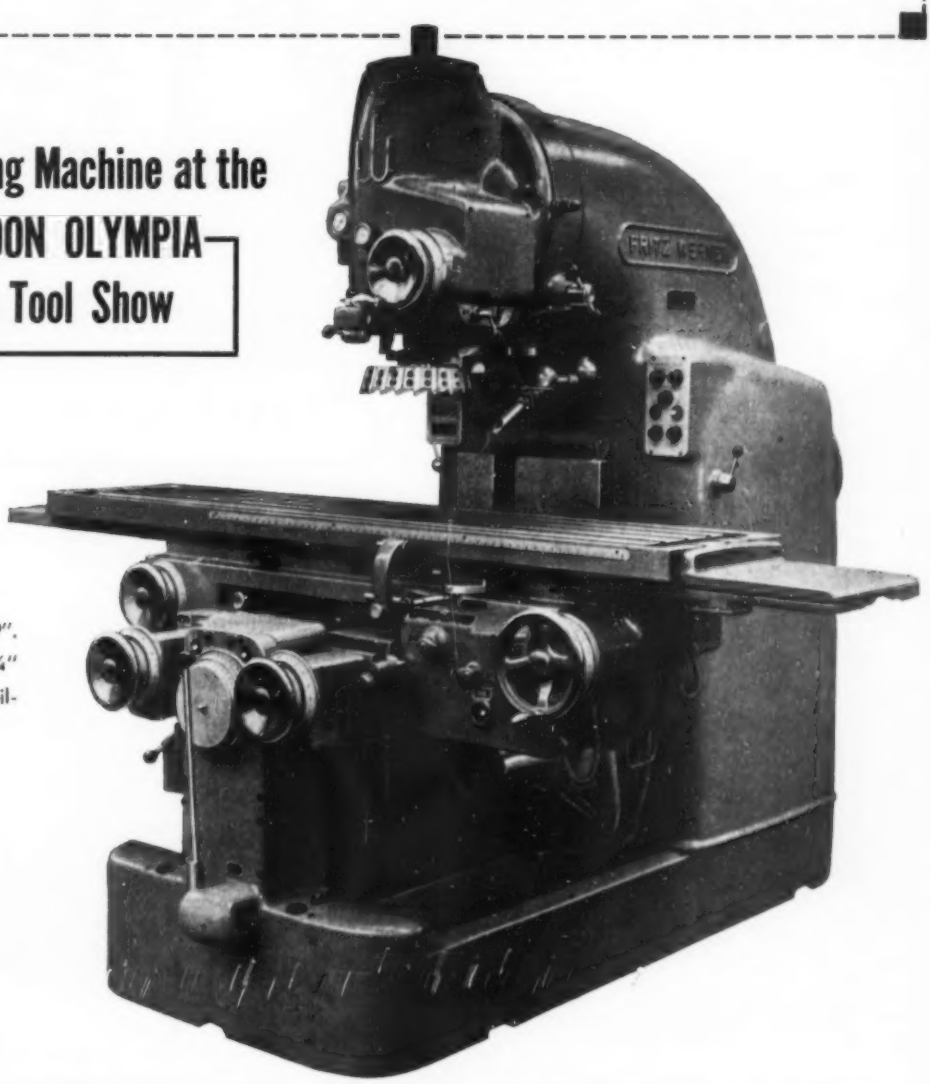

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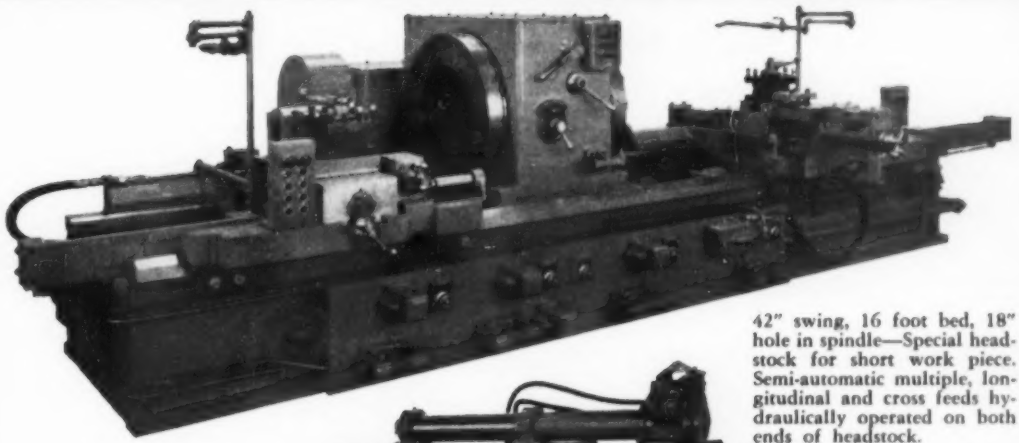

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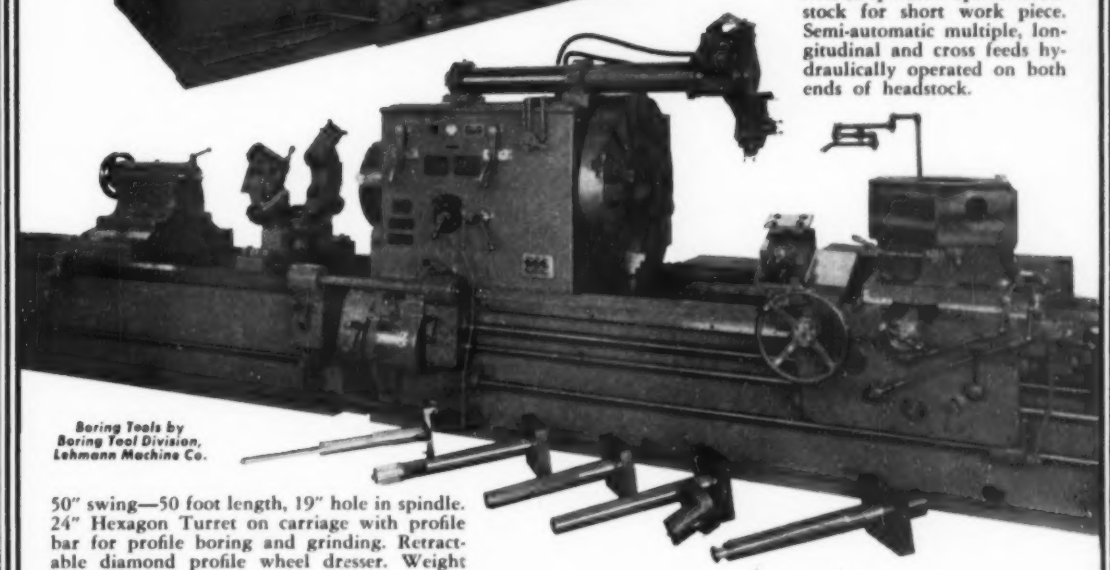

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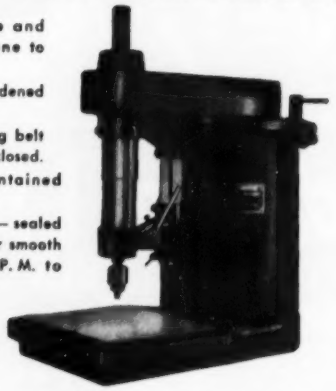

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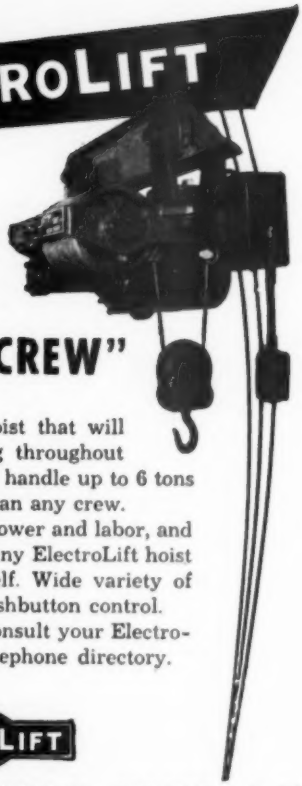

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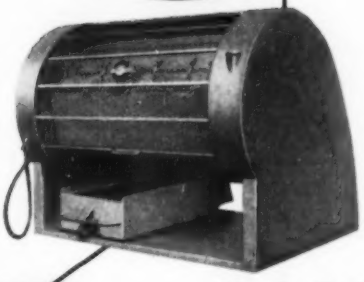

Model 66″, two compartments

MACHINES

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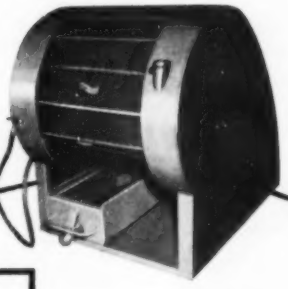
Grav-i-Flo 66″, 48″ and 36″ machines have cam locked doors with manually released safety stops; available with unlined or rubber lined cylinders, constant or variable speed drive, J.I.C. controls, and timers from 5 minute to 20 hour cycles. Equipped with electric wiring and water piping installed ready for plant hook up.



Model 36″, two compartments

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Designed For Small Lot Production and Laboratory Processing.

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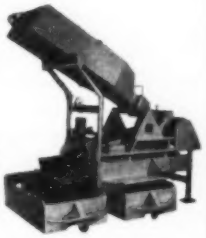
Two deck parts-and-chips separator and chip grader



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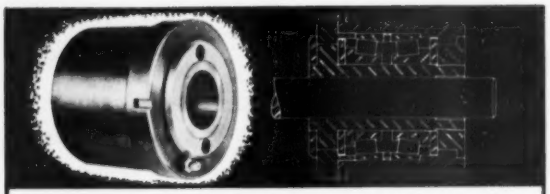

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- Absolute seal against coolants, grit and dust
- Bearings can be dissembled without removing housing
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- Protects against thrust loads as well as radial
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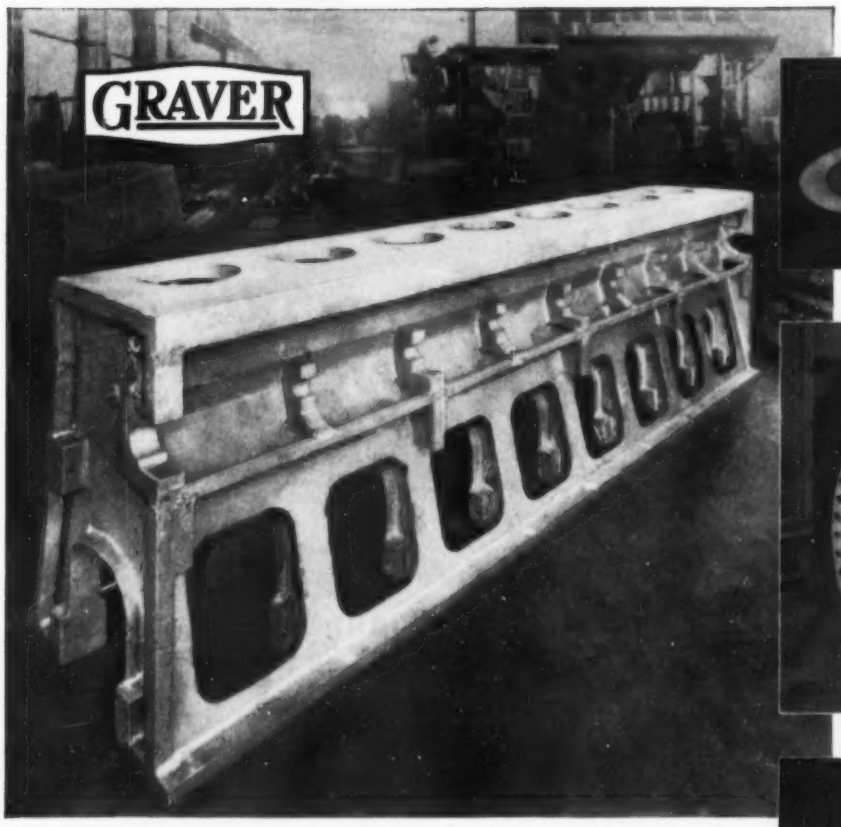
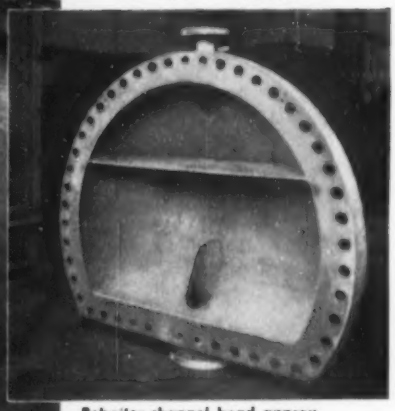
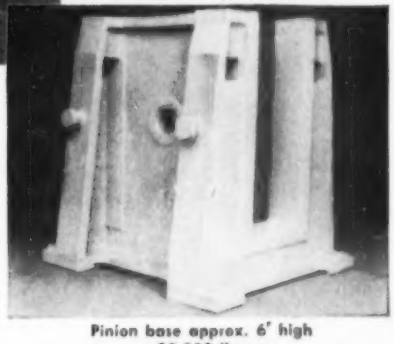


8-cylinder marine diesel engine block approx. 14′ long 12,850 lbs.

Turbine discharge deflectors
84″ O.D. 800 lbs.



Reboiler channel head approx.
7′ wide 4,500 lbs.



Pinion base approx. 6′ high
20,000 lbs.

Lead kettle approx. 11′ dia.
6,000 lbs.

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Graver is fully equipped to produce quality weldments to any specifications. Industry's recognition of this fact is reflected in the great variety of products constantly passing through Graver's weldery.

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Eliminate Work Transfers! Cut Set-up Time In Half!

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VERTICAL MILLING & PRECISION BORING

- Table Travel—
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- Vertical Capacity, 28"
- Table Feeds—Dial Type, 16
- Table Feeds—Inches per minute, 5/16"-20"
- Table Rapid Traverse—Both directions, 100"
- 16 Spindle Speeds, 40-2000 r.p.m.
- Boring Feeds—Infinitely variable, .0005"-.010"
- Horsepower, 7½ • Weight, 8100 lbs.

More production—faster—with less labor and lower cost! This accurate, versatile and rugged solid-base No. 50 is now doing the work of 2 or more machines in hundreds of busy plants!

The No. 50 incorporates every essential feature for handling an extremely wide range of difficult boring and vertical milling jobs with production-line speed and toolroom precision. Time-wasting work transfers are completely eliminated—set-up time is reduced to half or less!

A powerful 7½ H.P. all-gear motor provides power to spare for the toughest jobs. Convenient quick-action controls and full-vision work areas make operation easy and effortless.

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☐ Send information on Knight 20" and 42" Power-Feed Rotary Tables.

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"she might have been my kid..."

"There was no time to stop, see? She comes running out from behind this parked car right under my wheels. Her hair is in pigtails, and with the sun shining on it, she might have been *my* kid. We got her to the hospital. It took 3 pints of blood to bring her around. All I have to do is remember the sound of those screaming tires—and I know why *I'm* giving blood."

Yes, all kinds of people give blood—truck drivers, office workers, salesmen. And—for all kinds of reasons. But whatever *your* reason, this you can be sure of: Whether your blood goes to a local hospital, a combat area or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives!
✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

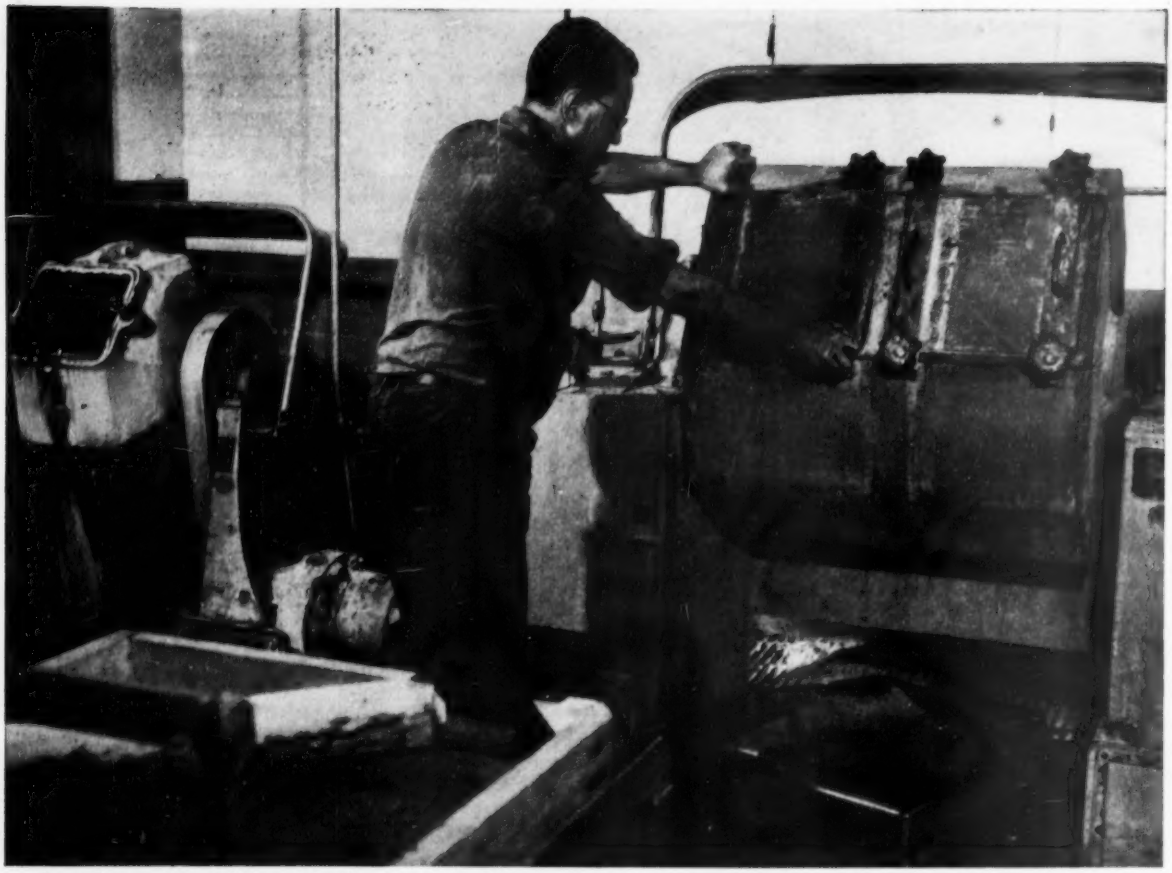
- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed your employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM



One of a number of different Tumbling barrels in which sample parts are processed in the new Norton barrel-finishing department.

New Norton sample processing department helps manufacturers speed up production

Plan now to take advantage of this new enlarged service department.

If you'd like to find faster methods for deburring and forming uniform radii on vitally needed parts — or if you have special problems in finishing parts ranging from tiny needles to castings and forgings weighing several pounds — send us samples of your parts. Tumbling is very likely the answer to your problem. And the new Norton sample processing department is the ideal set-up for finding just exactly what you can accomplish through barrel-finishing. Many manufacturers have already realized substantial savings and speed-ups in production through this service.

This new Norton department has a variety of Tumbling barrels of different types and capacities plus auxiliary equipment such as a mechanically vibrated screen. Here, Norton production engineers determine for you — without charge or obligation — just exactly what tumbling can do for the metal parts you send. Detailed recommendations are then given so that you can know exactly how to get the best results for your particular problem. These recommendations include barrel type, size and speed, size and amount of ALUNDUM* Tumbling Abrasives to be used, amount of water, type and amount of compound or cleaner, time cycles and other data.

Send Samples Now

For sample processing, we need: representative sample parts plus (a) the finished sample to be matched (hand-finished, if necessary) and (b) information on your present barrel-finishing equipment, if any, including type and size of barrel and barrel speeds. These should be sent to Norton Company, Worcester 6, Massachusetts, attention of Sales Engineering Department, Abrasive Division. About a week is required for processing the samples after they have been received.

Meanwhile, for further information get the 55-page Norton handbook on barrel-finishing. Ask your Norton Distributor for Form 501 or write us direct.

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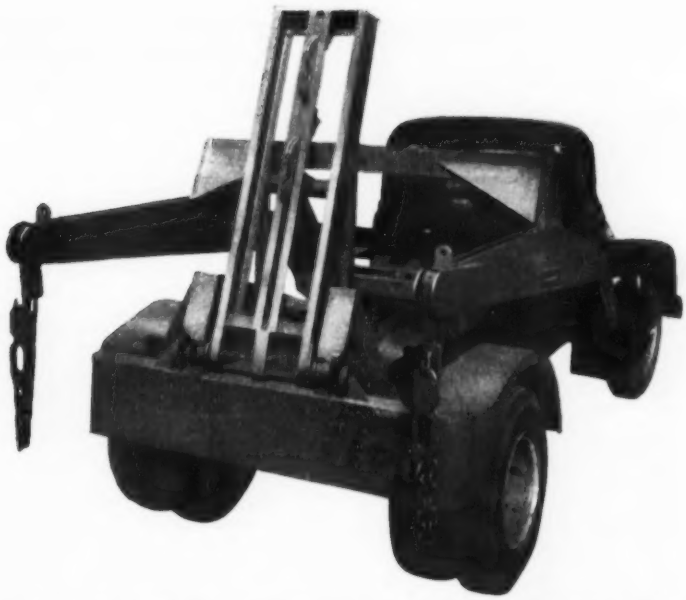
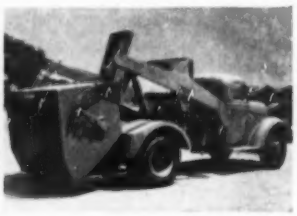
Making better products to make other products better



WHY USE 3 TO 5 TRUCKS... WHEN ONLY ONE WILL DO?

In many plants a Dempster-Dumpster, like the one above, operated by only one man, the driver, has replaced 3 to 5 conventional trucks and crews. The reason for this is that one truck-mounted Dempster-Dumpster serves scores of Dempster-Dumpster Detachable Containers up to four times the capacity of the average dump truck body. These containers are built in a wide variety of designs best suited to the type of materials handled—be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish. Containers are conveniently located at accumulation points inside and outside buildings. To illustrate the flexibility of the Dempster-Dumpster System in handling all types of materials in your plant, we show, at right, a few of the dozens of Dempster-Dumpster Containers built to meet every bulk materials handling need. And remember, one truck-mounted Dempster-Dumpster handles all containers, regardless of capacity or design.

The Dempster-Dumpster System eliminates standing idle time of crews and trucks . . . eliminates re-handling of materials . . . increases efficiency, sanitation and good housekeeping . . . cuts cost of truck equipment and operation tremendously. Without question, it's the most efficient and lowest cost method of bulk materials handling by truck ever devised! The chances are this system will save you thousands of dollars annually. This equipment manufactured and sold exclusively by Dempster Brothers, Inc.

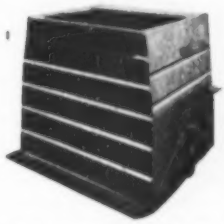


WHEN A CONTAINER IS FULL, the Dempster-Dumpster picks it up, hauls to destination and dumps the materials or sets load down intact. These three simple operations, shown above, are hydraulically controlled by driver in truck cab.

Drop Bottom Container built up to 10 cu. yd. capacity to handle heavy materials.

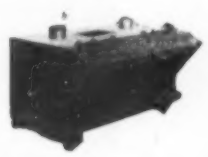
Tank Type Container meeting A.S.M.E. specifications. Capacities up to 1,200 gallons.

Tilt Type with Converged Lip for handling fine aggregate, wet or fluid materials.



Drop Bottom Pressed Steel Type for lighter service.

Universal Type built up to 12 cu. yd. capacity with top and end doors.



Five cu. yd. container with swivel casters for handling waste blast sand.

DEMPSTER BROTHERS, 413 Dempster Bldg., Knoxville 17, Tennessee

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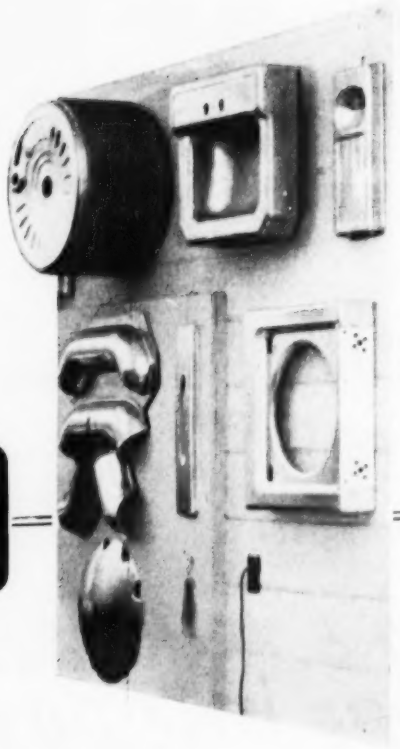
LAVATORY BASINS
to
HARROW DISCS



UNITED
DIES, TOOLS, JIGS
and FIXTURES

• Over the years UNITED has specialized on designing, developing and producing quality dies to meet the exacting requirements of manufacturers. For example they produced Large Cam Return Flange Dies for forming lavatory basins (as shown in above group) in one operation. The finished piece requires no added operations to produce the correct flange form required for enameling. Thus saving both time and costs and providing greater production.

This is only one instance whereby UNITED has developed intricate dies to simplify stamping operations and save costs for the manufacturer.

If you are interested in long lasting, precision dies—consult UNITED. They not only have the Engineering Organization and Shop Facilities but the experienced "know-how" to produce dies that will help you solve your production problems.

Consult UNITED on your Tool, Die, Jig and Fixture requirements.

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SPECIALLY DESIGNED
MACHINE TOOLS

have cut production costs for American industry.

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and Special Machines

MOLINE TOOL CO.
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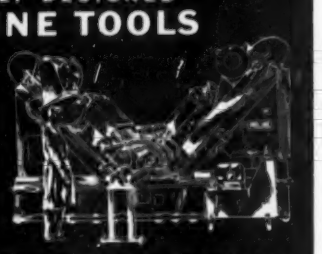

Boring V-8 Engine Cylinders

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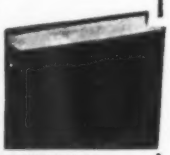

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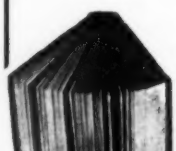

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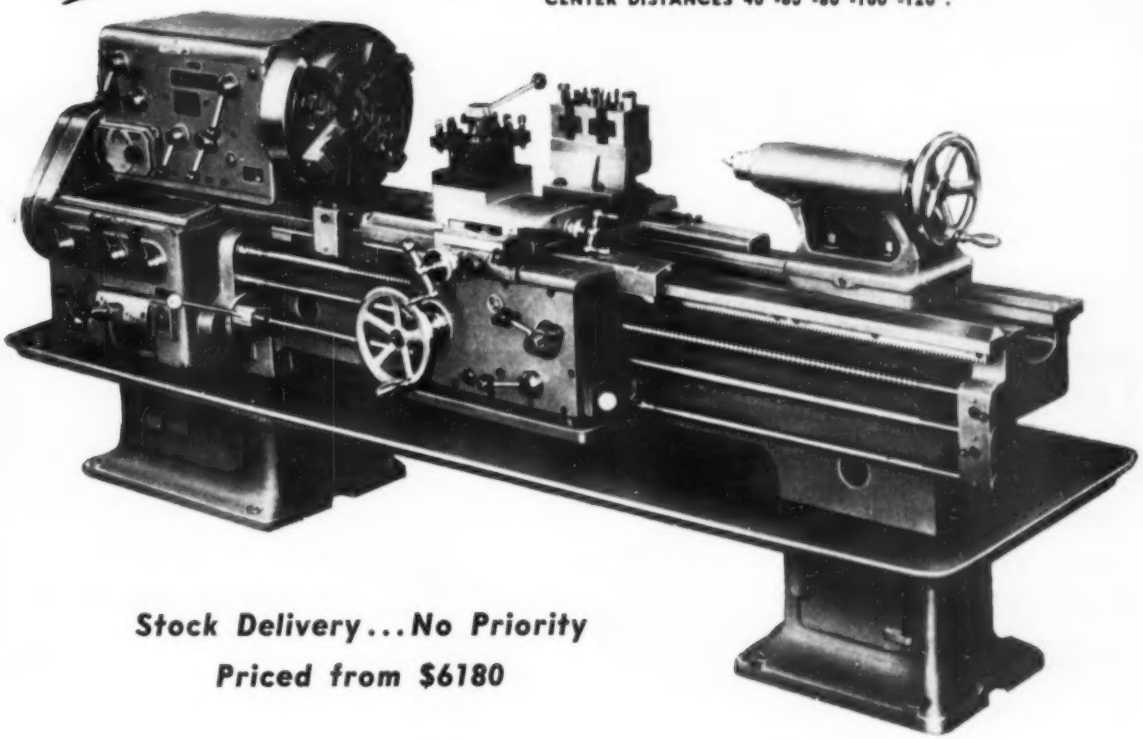

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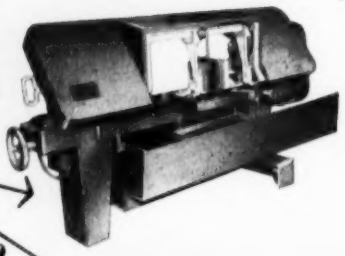

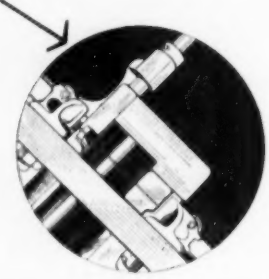

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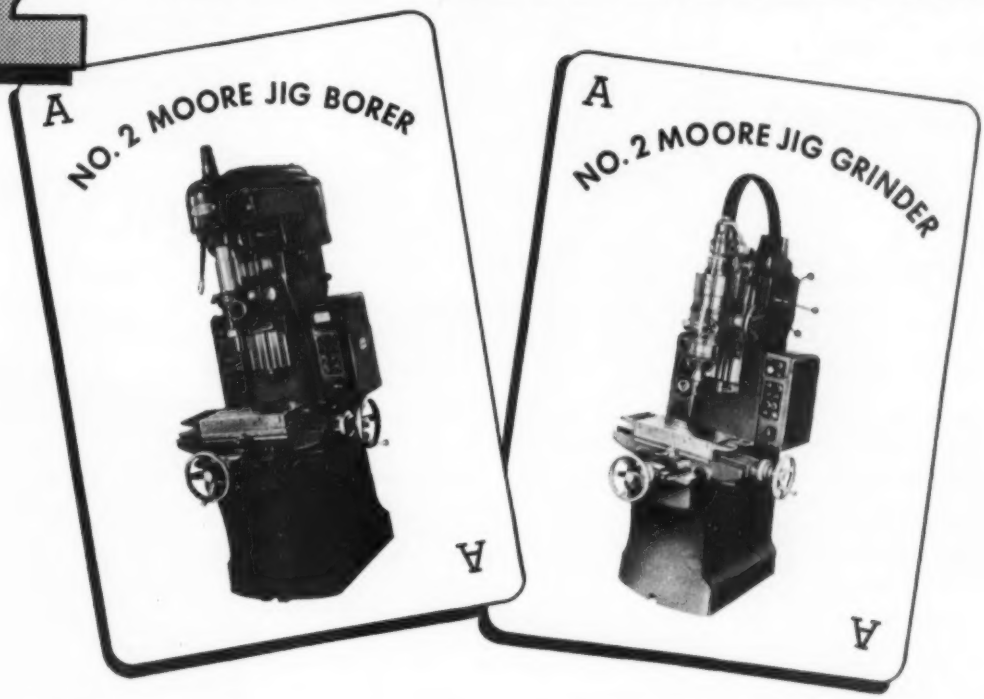

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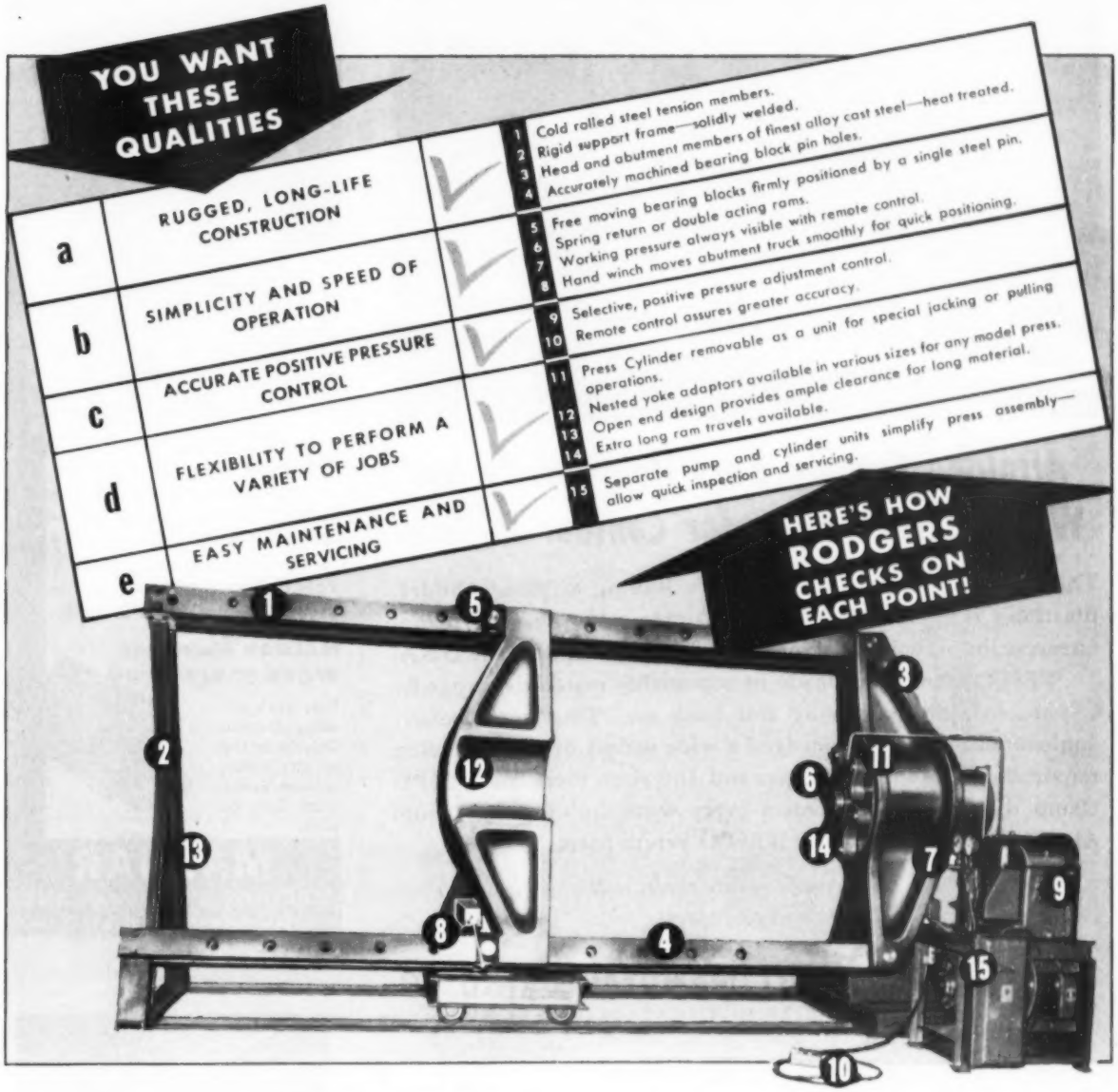
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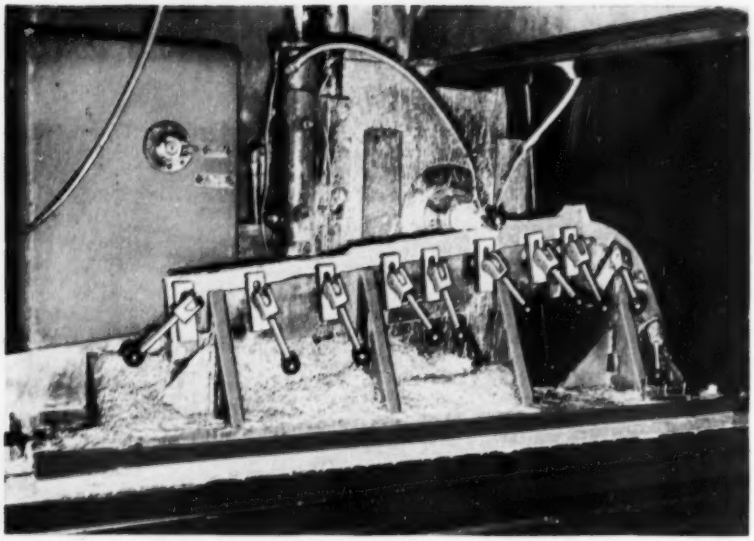

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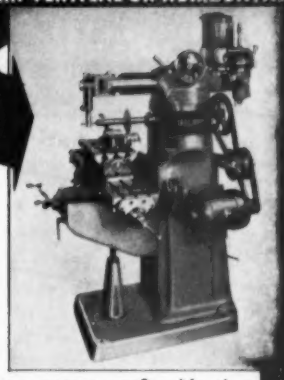

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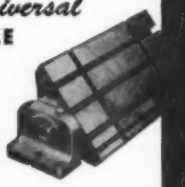

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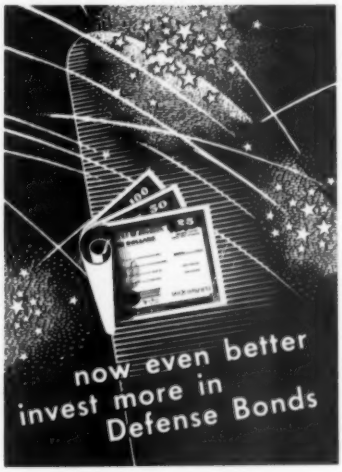

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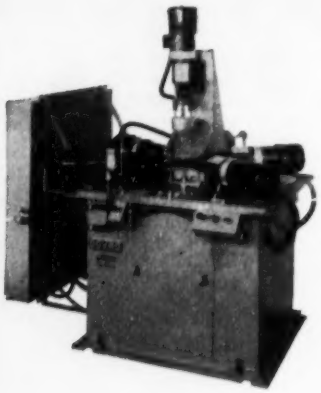

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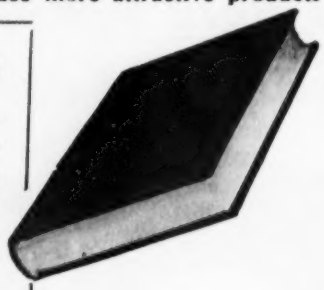

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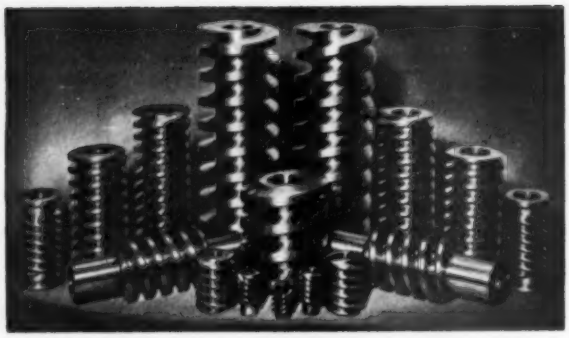

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Dubuque, Iowa, U. S. A.
ESTABLISHED 1883
FINE GEARS MADE TO YOUR SPECIFICATIONS

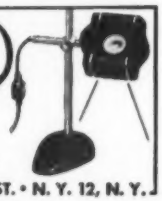
GEARS

WHEN TOOLING IS COSTLY GO V & O
Precision Power Presses and Feeds Since 1889
THE V & O PRESS CO. *Division of Emhart Mfg. Co.* HUDSON, N. Y.

American Machinist helps you sell

SCHERR MAGNI-RAY — The Illuminated MAGNIFIER for PRECISION INSPECTION

Oblique rays make scratches and defects stand out clearly.
Genuine optical glass lenses.
Heavy adjustable base.
Removable lens housing for inspection of large surfaces, engines, etc. . . .



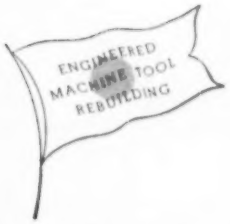
WRITE FOR ILLUSTRATED FOLDER
GEORGE SCHERR CO., Inc. • 200 D LAFAYETTE ST. • N. Y. 12, N. Y.

LUERS Patented Cutting Off Tool Holders — Patented Cutting Off Blades

ONLY the PATENTED construction of LUERS cutting off BLADES permits normal expansion of bursting chips MEANS MAXIMUM CUTTING EFFICIENCY

Manufactured By
J. Milton Luers — 12 Pine St. — Mt. Clemens, Mich.
Produced under License Issued by John Milton Luers Patents, Inc.

"Life Extension Institute" for Your Machine Tools



Speed was the problem here. As part of the Government machine tool re-activation program, Simmons has rebuilt over 400 machines. Shown in this bay (fore) are automatic screw machines, deep-hole drillers and various special tools. Despite this program, Simmons was able to continue its rebuilding for industry—thanks to its 120,000 square feet of plant capacity and diversified equipment.

Alignment of head and tail stock is part of the final test of this Landis grinder.

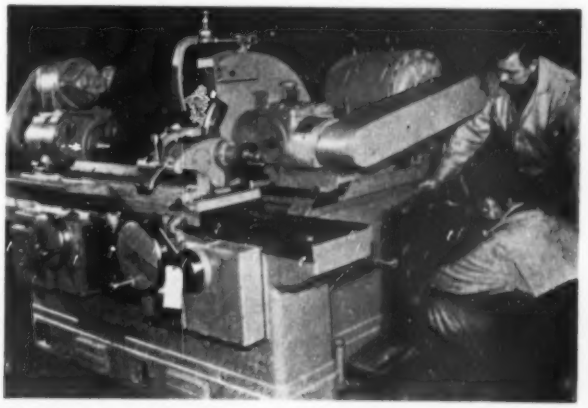
Sand blast facilities are maintained at Simmons to clean cast parts, remove inclusions.

Modernizing: To adapt these deep-hole drillers for carbide tooling, speed was doubled from 1500 to 3000 rpm; cooling system pressure was increased; heavier electrical equipment installed.

Rebuilding is the fastest way to get machine tools *today*. You will find that there are no long waits for delivery. *Engineered Rebuilding* guarantees user satisfaction. If you'd like to learn more about it, write for our quarterly, THE SIMMONS WAY.

SIMMONS MACHINE TOOL CORPORATION
1739 North Broadway, Albany 1, N. Y.

SIMMONS GIVES USED MACHINE TOOLS A NEW LEASE ON LIFE



Checking electrical systems is an important part of Simmons *Engineered Rebuilding*. Here, two technicians check a control panel on a rebuilt Cincinnati grinder prior to inspection.

The Reader AUDITED PAID CIRCULATION ABC *His Mark*

THE ABC SYMBOL which is printed at the head of this page is, in a very real sense, *your* brand on this magazine. Those letters stand for Audit Bureau of Circulations. The symbol indicates that the magazine is a member and supporter of that Bureau.

To the advertiser who contemplates using the magazine as an advertising medium, this symbol has a well-recognized significance. It tells him that the circulation records and practices of the magazine are wide open to the auditors of the Bureau, who check the publisher's claims and make public the precise terms and conditions under which subscriptions are obtained. And it assures him that the magazine stays in business by virtue of a demonstrated demand from its readers as shown by their paid subscriptions or newsstand purchases.

BUT HERE we are concerned only with the significance of ABC to you as a reader. For when the advertisers, the advertising agencies, and the publishers founded the Bureau nearly forty years ago to help establish honest circulation figures, they unwittingly set up a cooperative institution that has become a major safeguard for the interests of the reading public.

That is because membership in ABC constitutes one of the strongest guarantees that any publication can offer of its primary devotion to the interests of its readers. And by making that guarantee possible, ABC becomes a major safeguard of the freedom of the press, an objective of exceptional importance in these days when the public is flooded with propaganda from so many sources.

THE SUREST MEANS by which to preserve a free press is to keep it directly answerable to the reading public it would serve. It follows, then, that the survival of a truly free press must depend on its acceptance by that public; and that means in turn that the people must have in their hands some adequate means for holding the publishers responsible to them.

No one has yet devised any means to that end more simple, more direct or more practical than the paid subscription or newsstand purchase price. The right to purchase or refrain from purchasing a publication gives to the readers and to no one else the power to pass judgment on whether that publication should continue to serve the reading public.

TO SUPERVISE this vital process, to check and certify the integrity of the publication's circulation methods and claims, requires a strict and continuing audit of each publication's success in meeting this test of its public acceptance. To that essential function the ABC has contributed mightily by the conscientious performance of its mission. And that is why we are able to have a press supported, for the most part, by advertising revenues, but not controlled as to its circulation or content by any influence other than its readers

When an advertiser consults the ABC statement of a publication to ascertain the amount, the quality and the trend of its circulation, he does so in the legitimate pursuit of his own interest. But at the same time, inevitably, he is helping the ABC to keep the press responsible and responsive to the reading public. For, in effect, he is asking the publication to demonstrate through its circulation figures that it owes its standing to a voluntary demand by its readers.

SO THE Audit Bureau of Circulations, by auditing and certifying paid circulations, has come to perform a vital service to the readers of this magazine and of every other member publication. And in performing that service, it helps to maintain in our country a press that is answerable to the reading public and to it alone. So long as the practices and principles for which ABC stands continue to prevail in American publishing, we shall find in it a sure support for a truly free press, responsible only to the public it serves.

McGraw-Hill Publishing Company

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE

$1.20 per line, minmum 3 lines. To figure advance payment count 5 average words as a line.

POSITION WANTED and Individual Selling Opportunity undisplayed rate is one-half of above, rate, payable in advance.

PROPOSALS $1.20 a line an insertion.

INFORMATION

BOX NUMBERS count 1 line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

EQUIPMENT WANTED OR FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE

The advertising rate is $10.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches to a page. **A.M.**

NEW ADVERTISEMENTS: Address N.Y. Office, 330 W. 42 St., N.Y. 36, N.Y. for Feb. 2nd issue closing Jan 19th

---

Excellent Tools

No. 4 **Cincinnati** High Powered Horiz. Milling Machine. Rectangular Overarm. Timken Bearings. Tbl. 19" x 72". Motor on Base.

20" x 46" ctrs. **Springfield** Geared Head Lathe. Motor in Base.

30" x 30" x 8' **Gray** Planer. 2 Heads on Cross Rail. Mtr. Drive.

ABOVE TOOLS IN STOCK FOR IMMEDIATE DELIVERY.

ROYAL MACHINERY
401 Broome St. New York, N. Y.
CAnal 6-5484

MONA MOTORS

NATCO HEAVY DUTY DRILL PRESS
No. B225H
Excellent condition; Late
LATE TYPE MACHINE TOOLS IN STOCK
SEND US YOUR REQUIREMENTS

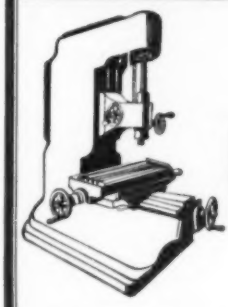
Wade-Presdee, INC.
1311 St. Clair Ave.
Cleveland, Ohio
SUPERIOR 1-9300

P. & W. 30" 2-Spindle Vert. Profiler
Fellows Straight Line Gear Generator
Hardinge Model MD-37 Lathe, ⅝" cap.
P. & W. 4½" x 36" Thread Mill, 1941

D. E. DONY MACHINERY CO.
47 Laurelton Rd., Rochester 9, N. Y.

ELECTRIC FURNACE TO 1850°
8 x 12 x 15 inside with Auto. Temperature Control 4.5 K.W. Sliding door, cheap to operate. Substantial. Dependable for Machine Shop—Tool Room. New. $250.
E. H. WILLIAMS
BOX 9042A, HUNTINGTON, W. VA.

FOR SALE
GARDNER HORIZONTAL DISC GRINDER
Model #179, 72" Segment Type Wheel
Complete with Motor, Electrical Equipment and Wheel Dresser
Excellent Condition
WINSTON MACHINERY CO., INC.
326 West Ohio St. Indianapolis 2, Ind.



SEARCHLIGHT Equipment Spotting SERVICE

This service is aimed at helping you, the reader of AMERICAN MACHINIST, locate used and surplus new metalworking machinery and equipment not currently advertised.

Just send in the specifications of the equipment wanted on the coupon below, or on your own company letterhead, to

Searchlight Equipment Spotting Service
c/o American Machinist
330 W. 42nd St., N.Y. 36, N.Y.

Your requirements will be brought promptly to the attention of the used equipment dealers advertising in this issue. You will receive replies directly from them.

NO CHARGE • NO OBLIGATION

Searchlight Equipment Spotting Service
c/o American Machinist
330 W. 42nd St., New York 36, N. Y.

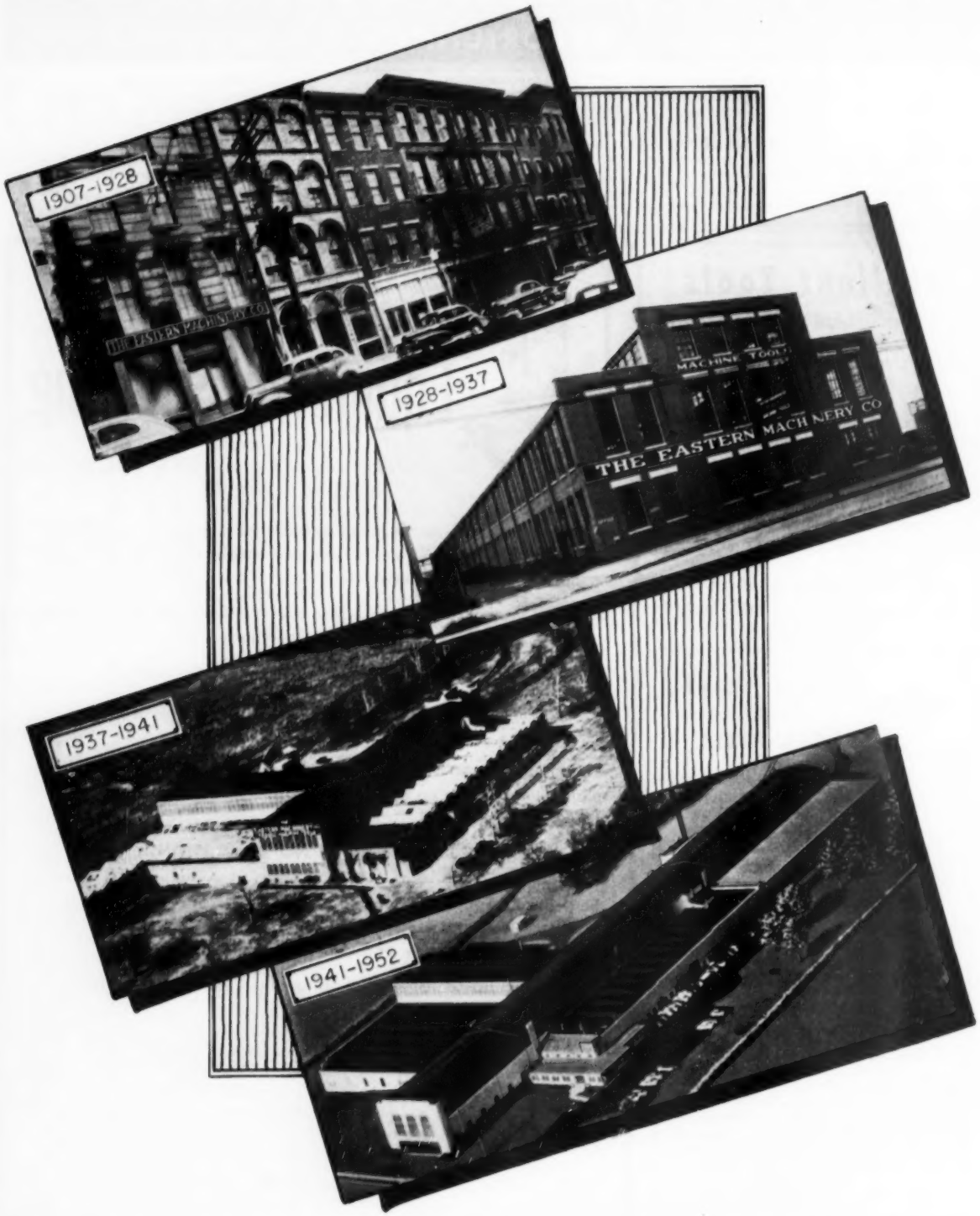
Please help us locate the following used equipment:

NAME ..... TITLE .....

COMPANY .....

STREET .....

CITY ..... ZONE ..... STATE .....



THE EASTERN MACHINERY COMPANY

MElrose 1241 **1004 Tennessee Ave., Cincinnati 29, Ohio** Cable Address: EMCO

"NOTHING UP OUR SLEEVES"! . . .

Take a look at the pictures on the opposite page.

The growth of THE EASTERN MACHINERY CO. as shown by the pictures has been due *solely* to furnishing industry with high grade—*honestly* Rebuilt Machine Tools.

No "magic", "nothing up our sleeves", nothing but good machinery—rebuilt by the master craftsmen of Cincinnati—the machine tool capital of the world.

Visitors always welcome to look over the 2000 Machine Tools always carried in stock in our 135,000 square foot plant.

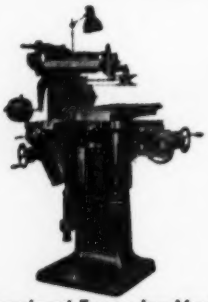
Watch our ads in every issue of American Machinist for the current listings.

Why spend time & money hunting "Elusive Rabbits"? Buy from a source of supply that advertises only the machines IN STOCK.

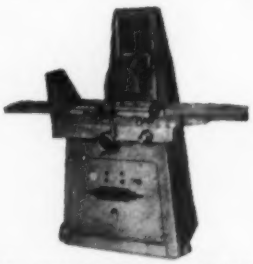
THE EASTERN MACHINERY COMPANY

MElrose 1241 **1004 Tennessee Ave., Cincinnati 29, Ohio** Cable Address: EMCO

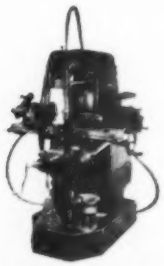
AARON • NEW AND USED



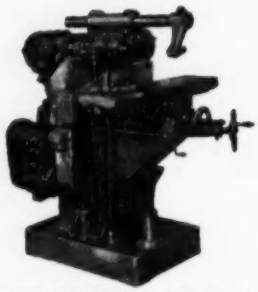
3 dimensional Engraving Machines similar to GK2 Deckel Ratio 1-1.5-1-10



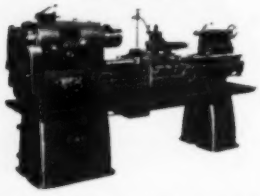
NEW 6"x18" Surface Grinder, Rapid Traverse, Built in Wheel Dresser & Coolant System, Horizontal, Traverse & Vertical Power Feeds.



New Universal Mill with dividing heads and vertical attachments



NEW COMBINED VERTICAL-HORIZONTAL MILLING MACHINE

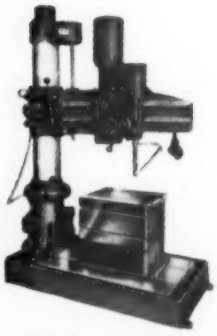


New 16, 20, and 24 inch Geared Head Lathes. Same with removable gap. All fully equipped

New Vertical Mill universal table, swivel head

NEW BOX COLUMN GEARED DRILL PRESS. 2" Capacity. 6 Speeds.

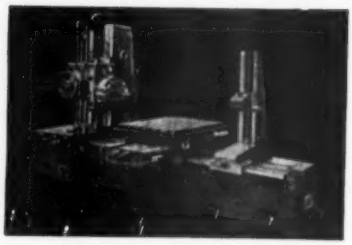
No. 110 Hamilton Tryout Press Rebuilt. F to B, R to L 50" x 111" bed area. Motor and Controls.



NEW RADIAL DRILS

NEW IN STOCK

Air Hydraulic Presses — Arbor Presses 26C Famco — Band Saws Kalamazoo — Famco 6x12"—Drill Presses all sizes—Hydraulic Press Northern 20 Ton — Injection Molders, 1 ounce — Power Presses, OBI, 1, 4, 4½, 5, 7½, 10, 15, 20, 30, 60 & 85 ton—Shaper 7" Amco, 8" Shaperite—Shaper Sheldon 12" — Shears, Foot 22, to 8', 16 & 18 ga.—Shears, Power 3'x18 gauge to 10' x 10 ga.—Welders, Arc, Seam, Spot all sizes —Vert. Milling Attach. Halco H.S. Motors, Grinders, Buffers, all sizes.



New 3" Boring Mill with swivel table

AARON MACHINERY CO., Inc.

This is but a partial list. Write for free Catalog. Inquiries invited.

AARON MACHINERY CO., INC.

TOOLS • IMMEDIATE DELIVERY

BORING MILLS

Bullard 24" V.T.L., Spiral Drive
Cleveland 2½" Bar Cap.
Giddings & Lewis No. 32, 3" cap.
King 42", 72" Vert. 2 rail heads
Niles-Bement-Pond 4", 4½" Bar, 60" Vert.
New 3" Hor. Bor. Mills

DRILLS AND RADIALS

American 6'x15" Univ.
Baush Multi-spindle
Buffalo #2 Motor Spindle
Canedy-Otto 21" Sliding head, New
Cincinnati Bickford 6'x15" col.
Natco #12 20 spindle drill, Baush
24" Sibley Sliding head
New Geared Box Col. Drills 24'
Foote-Burt #25 3" cap.
Leland Gifford 2 LMS 3 MS

ENGRAVERS

Deckel type 3 Dim., New
Gorton #1A, ME, Deckel GIL., GK2
Taylor-Hobson 3 dim.

GEAR EQUIPMENT

Barber-Colman #2, #12 (3), Flather 72" Cutter
Fellows High Speed Shapers 712, 725, 71
Fellows #20M Redliner
Gleason No. 3 Spiral, No. 3 Straight Bevel
Gorton Graduating Machine
Gleason #2 Surface Hardener
Gould & Eberhardt 36" Cutter
Michigan Gear Finisher 24" cap. 862-24-A
National Broach Red Ring Lapper
Schuchardt & Shutte #1 Hobber

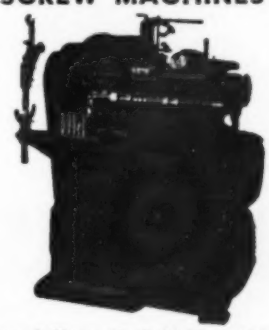
GRINDERS, MISCELLANEOUS

Bryant #5, Internal, chucking, 16A16
Cincinnati 6x18" Cyl. Hyd.
Grenby Models 1G1 & 1G2
Heald #73 Internal Centerless, Sizematic
Heald #81 Internal Gagematic
Heald 72A3 Int. Centerless Sizematic
Landis 6"x30" Type C Cyl., 10x24 Univ.
Norton Type C 6"x18" Semi-Automatic cyl.
Norton 6"x30", 10"x18" Type C cyl.
Norton 14"x96" cyl., 16x48 Univ.
Norton Roll Grinder 50"x26'
Oliver #510 Drill Pointer
Sellers 6T Tool, K.O. Lee tool
Van Norman #666 Crankshaft

MILLS, VERTICAL

Brand New Vertical Mills
Cincinnati 4 Sp. Vertical
Cincinnati 00 Vertical, 1-18 Automatic
Morey #12M Profiler, 2 sp.
Pratt & Whitney Profiler 12B, 2 sp.

AUTOMATIC SCREW MACHINES



Brown & Sharpe (12) Model 0G, serial Nos. 9600 & 10700 series, ⅝" capacity.
Brown & Sharpe (7) Model 00G, serial Nos. 14, 15, 16000 series, ⅝ capacity.
Brown & Sharpe (4) Model 2G, serial Nos. 8500 & 11500 series, 1¼" capacity.
Coco Swiss Type ⅝" cap.
Cleveland, Model AA-11, Serial #36586.
Cleveland, Model B, Serial #42618/483, 1-1/16" capacity.
Conomatic 8 sp., serial 3947VB, 1⅝".
Conomatic 4 Spindle, Serial 2309FF, 1¼" cap.
New Britain Gridley 61 6 Spindle, Serial No.

MILLS, PLAIN, UNIV. PROD.

Brand New Universal Mills No. 1, No. 2
Archdale Plain, 44", Production
Brown & Sharpe #3B Plain, Late, 3A, 2I, #2L
Cinn. No. 3, 4 Plain Spd., 18" Manufacturing
Kent Owens IV, 1-B, 1-14, 1M
Kempsmith #1 Pl., Vert. & Div. Hd.
Milwaukee 2K, 2H Univ., 2H Plain.
Milwaukee #2B, Plain & Univ.
Sundstrand #0, 0, Rigidmils
Sundstrand #3A Rigidmil with copying Attach.
Van Norman #2L Univ.

GRINDERS, SURFACE

New 8x24" Hyd. Feed, 10x18"
Abrasive 8x24", #33 Vert. & #34
Blanchard #16, 26" Mag. Chuck
Heald 22—12" chuck, Arter 12"
Norton 6x18" Hyd. 10x36" Hydr.
Portman 12" Chuck Rotary
Pratt & Whitney 12x36" Vert.
Reid 11x36 Motor in Base, 2A 6x18
Taft Pierce #1 Precision

LATHES

American 14"x10
Bridgeford 36"x20', 32"x16'
Hendey 12"x42" and 12x30", 1941, 16x66"
Hendey 14" Yoke Head Lathes
LeBlond Regal 10"x3' bed, 19x42", 25/50x96
Lipe-Carbo 12"x18" (2)
Pratt & Whitney 16"x60—Late
Ledge & Shipley #3A, #3 Duomatics
New 16, 18, 20", 28" Immediate Del.
Reid Small Piece #9WSL
Rivett Model 918 Precision
Sundstrand 8x15", 15' Stub
Sebastian 12"x4' G.H., Sheldon 12"
Wickes 32"x35' Geared Head

TURRET LATHES

Acme GW Fay 2-9/16" Cap. #2 Cross Slid. Turret
Bardons & Oliver #2, 3, 5, 7
Brown & Sharpe, #2 Hand, #10, 11
Denver 6 2" Shell Turret (2)
Foster #2B 2½" Cap. Morey #2G, Late
Gisholt 2L, Cross Slid. Tur. #5 Bar Feed, Chuck
Gisholt Simplimatic
Morey #2G, Late
Oster 601 WD, #2 Simmons Microspred
Warner & Swasey #1, 1A, 2

PRESSES

Bliss 645, 650 Hi-Production Presses
Bliss 18, 21, OBI, 58, 67, 162, OB
Bliss 4½ Double Action, Roll Feeds, Cam (2)
Bliss #78½, 330 Ton BS, Bliss 79½
Hamilton 850 Ton S. S. Brd 27x48
Hamilton 110 FM Die Tryout Press
Bliss 5-48 Dbl. 32x48" bed, Cushion 25410, 1⅝" capacity.
Toledo 92½ Dbl. Crank 43x23" bed
New 85, 60, 55, 30, 20, 15, 10, 5 Ton O.B.I.
Niagara Herning, 15 Ton, Niagara 27
Niagara A 1½ O.B.I.
Stokes Tablet Press Type R—Late
Toledo 29 Double Action Cam
V. & O. #102 O.B.I. Reducing
Walsh No. 3 O.B.I. 23 Ton, L) #3

• HYDRAULIC EQUIPMENT •

COMPLETELY ENGINEERED AND CHECKED BY A COMPETENT STAFF. SEND US YOUR HYDRAULIC PROBLEMS.

800 TON WILLIAMS & WHITE AIRCRAFT PRESS, with up-moving ram and 2 kick cylinders. Moving platen 42" L-R, 60" F-R, top platen 42" L-R, 72" F-R, 12" stroke, 24" daylight, powered by 40 H.P. 3/60/220-440 motor. Speeds advance 260, I.P.M., Pressing 16, I.P.M. Fast gravity return. Complete with valves, piping and pad holder.

600 TON WILLIAMS & WHITE AIRCRAFT PRESS, with up-moving ram and kick cylinders, platen 42" L-R, 60" F-R, powered by 20 H.P. 3/60/220-440 motor. Speeds 240 I.P.M. advance, 7½, I.P.M. pressing, fast gravity return, complete with valves, piping and pad holder.

70 TON SHELL TESTING PRESS. For testing 75 to 155 MM shells, from 2500 pounds to 25,000 pounds per square inch, press equipped with 3 position turn table, one for loading, one for testing, one for unloading, powered by 7½ HP 3/60/220 motor.

125 TON DOWN MOVING RAM HYDRAULIC PRESS, with bed 96" L-R, 30" F-R, distance between rods L-R 25", 30" F-R, ram to bed adjustable from 24" to 48" opening. Stroke of ram 30", powered by 25 HP 3/60/220-440 volt motor and oil gear radial pump, complete with operating valve and piping. Can be used as Casting Straightening Press.

800 TON WATSON-STILLMAN HOBBING PRESS, Platen 26x27, 6" stroke, opening 30".

300 TON WATSON-STILLMAN, Up Moving Ram, 20x20 platen, 8" stroke, 19" opening.

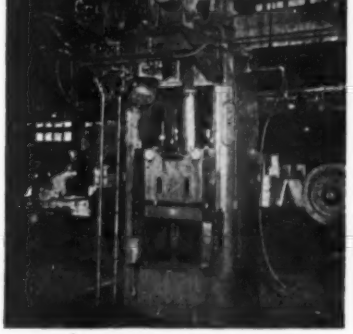
300 TON WATSON-STILLMAN, Up Moving Ram, 24x29 Platen, 20" stroke, 30" opening.

250 TON WATSON-STILLMAN, Up Moving Ram, 28x24 Platen, 8" stroke, 13½" opening.

140 TON WATSON-STILLMAN, Up Moving Ram, Platen 22x16, 14" stroke, 29" opening.

62 TON WATSON-STILLMAN, 15x15 platen, 6" ram, 10" stroke, 16" opening.

85 TON WATERBURY FARREL 20x24 platen, 18" stroke, 35" opening, 12" up-moving ram.



H.P.M. TRIPLE ACTION PRESS

150 tons on main ram, stroke 36", 50 tons on blank holder, stroke 18", 50 tons on cushion, stroke 18", bed size 36" x 36", vertical opening between ram platen and bed 56½", blank holder 6" thick, cushion bolster 4¼" thick. Press powered by 40 HP 3/60/220-440 motor. Speeds 840-100-840 I.P.M.

28 TON WATSON STILLMAN, 18x18 platen, 8" stroke, 18" opening, 5½" up-moving ram.

150 TON H.P.M., 30x30 platen, 14½" opening and stroke, 13" up-moving ram.

1000 TON WATERBURY FARREL, platen 30x26, 5" stroke, 20" up-moving ram.

9 OUNCE HPM INJECTION MOLDING MACHINE, 250 ton capacity clamping pressure, built 1946, injection pressure 20,000 lbs. 20 HP 3/60/220-440 motor.

9 OUNCE HPM INJECTION MOLDING MACHINE, Built 1941, 200 ton clamping pressure, injection pressure 24,000 lbs. 15 HP 3/60/220-440 motor.

8 OUNCE WATSON-STILLMAN INJECTION MACHINE, Built 1941, 200 ton clamping pressure, injection pressure 32000 lbs., 40 H.P. 3/60/220-440 volt motor.

4 OUNCE DE MATTIA HORIZ. INJECTION MACHINE, 10 HP 3/60/220-440 motor.

ONE OUNCE HAND OPERATED SAV-WAY VERTICAL INJECTION MOLDING MACHINE.

250 TON SOUTHWARK DOWN MOVING RAM PRESS, 48" stroke, about 78" opening platen size 28" L-R, 48" F-R, operating pressure 1550 pounds per square inch.

200 TON CHAMBERSBURG DOWN MOVING RAM PRESS, 10" stroke, 27" opening, platen size 23" L-R, 16" F-R, operating pressure 2100 pounds per square inch.

Vickers Var. Pressure Variable Delivery Pump, 50 gallons, 2000-2500 pounds pressure.

Vickers Var. Pressure Variable Delivery Pump, 50 gallons, 1500 pounds pressure.

Oil Gear Var. Pressure, Variable Delivery Pump, 23 gallons, 1100 pounds pressure.

Oil Gear Var. Pressure, Variable Delivery Pump, 5½ gallons, 2500 pounds pressure.

H.P.M. Var. Pressure, Variable Delivery Pump, 20 gallons, 1500 pounds pressure.

Watson-Stillman Stediflow Var. Pressure, Variable Delivery Pump, 8 gallons, 4000 pounds pressure.

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AUTOMATIC, #00G Brown & Sharpe, M.D.
AUTOMATIC, Cleveland Model #B-1½" Sgl. Spdl.
AUTOMATIC, Semi #2 B & S Wire Feed, 1" screw.

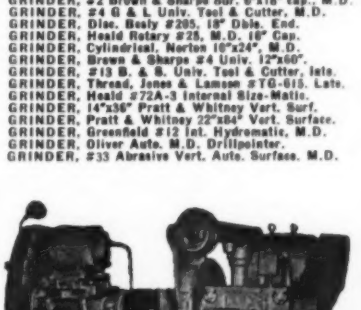
BALANCER, Anderson Bros. 14"x64", Rots-Checker.
BORING MILL, 24" Bullard M.D., V.T.L.
BORING MILL, 36" Bullard M.D., V.T.L.
BORING MILL, 36"x44" Niles Vert, M.D., Side Head
BORING MILL, 10" Cincl-Vert., M.D. 2 heads.
BORING MILL, 2¼" Lucas Horiz., M.D.
BORING MILL, Lucas Horiz. 3" Bar, M.D.
BORING MILL, Giddings & L #8 Horiz. 3½" Bar.
BARRELS, Tumbling Lupomatic, Schutte & Koerting.
BROACH, #3 LaPointe Horiz. 50" Str. M.D.

COMPRESSOR, Ingersoll Rand ER-1, 10 HP, M.D.
COMP., 15 HP, 10 HP, Gardner Denver, M.D., New.
COMPRESSOR, C-P 50 HP., M.D., 10x10, 278 CFM.
COM., Ing.-Rand ER-1, 100 HP Syn. M.D.
CRANE, DET Ricker 2 tons 11'9" span.
CRANE, Canton #8 Portable Gooseneck 3 ton cap.
CHIP WRINGER, Barrett #251, M.D., 18" dia.
CHIP WRINGER, 20" Tolhurst M.D., Late.
GAS CUTTER, Airco #4 & #10 DB Radiagraph.

RADIAL DRILL, 3' 9" Mueller, M.D.
RADIAL DRILL, 4'x11' American, M.D.
RADIAL DRILL, 5'13" Cincinnati-Bickford, M.D.
RADIAL DRILL, 5'x17" Cincl.-Bickford Super Service.
RADIAL DRILL, 6'x13" Cincinnati-Bickford, M.D.
RADIAL DRILL, 30" Walker Turner M.D., Late
DRILL, Fosdick 16", S.S. Power Feed, M.D.
DRILL, #2 Colburn H.D. #4 M.T., M.D.
DRILL, #121 Baker Auto., S.S. Cam Operated.
DRILL, Deep Hole, Avey-Draulic #2, M.D.
DRILL, Deep Hole, Pratt Whitney #2 Gun Barrel.
DRIL, Edlund #2B, 3 spdle. #2 M.T., 16".
DRILL, 4 & 6 Sp. Avey 12" overhang, #3 M.T., M.D.
DRILL, 4 Sp. Barnes H.D., M.D. #4 M.T., P.F.
DRILL, Cincinnati 21" with Tapping Attach. M.D.
DRILL, Natco Multiple Spdle. #12, #1 M.T., M.D.
DRILL PRESSES, Leland Gifford #1MS, 1, 2, 3, 4.
DRILL PRESS, #2MS Buffalo Forge single spindle.
DRILL, Barnes, 24" S.S. #4 M.T., 16" cap.
DRILL PRESS, #25 Foote-Burt S.S. 24", #5 M.T.
DRILLS, #14, #15, #16, #18 Buffalo Forge, M.D.
DEEPFREEZE Motor Products 40 below zero.
DEMAGNETIZER, SB-911 Magnaflux, late type.

FACING HEADS, 20" & 24" Mummert-Dixon.
FILER, #11-S Cochrane Bly Auto Saw Filer.
FILER, Type P4, Oliver Floor Type, M.D.
FURNACE, Westinghouse Elec. 18 KW, 2100° F. cap.
FURNACE, Machler Steam Oven, Serial #3543.

GRINDER, M.D. Sanford Surf. 6"x12" cap., New.
GRINDER, #1 Wilmarth Norman Hand Surf., 6"x12".
GRINDER, #2 Imperial Univ. Tool & Cutter, New.
GRINDER, #2 Brown & Sharpe Sur. 6"x18" cap., M.D.
GRINDER, #4 G & L Univ. Tool & Cutter, M.D.
GRINDER, Disc, Besly #205, 18" Dble. End.
GRINDER, Heald Rotary #25, M.D. 18" Cap.
GRINDER, Cylindrical, Norton 16"x24", M.D.
GRINDER, Brown & Sharpe #4 Univ. 12"x60".
GRINDER, #13 D. & S. Univ. Tool & Cutter, late.
GRINDER, Thread, Jones & Lamson #TG-615, Late.
GRINDER, Heald #72A-3 Internal Size-Matic.
GRINDER, 14"x36" Pratt & Whitney Vert. Surf.
GRINDER, Pratt & Whitney 22"x84" Vert. Surface.
GRINDER, Greenfield #12 Int. Hydromatic, M.D.
GRINDER, Oliver Auto. M.D. Drillpointer.
GRINDER, #33 Abrasive Vert. Auto. Surfacer, M.D.



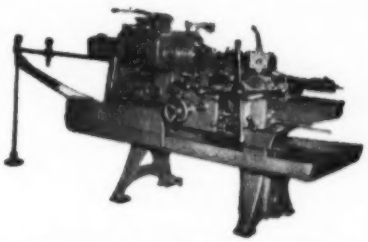
LANDIS 6 x 18 Hyd. Cyl. Grinder, Type C. Serial #29196.

GRINDER, #22 Heald Horiz. Rotary Surface, M.D.
GRINDER, Diamond Snagging 10 HP, 24"x4½".
GRINDER, Norton 6x18 Vert. Surface, Hyd. Late.
GRINDER, #60 & #70 Heald Internal.
GRINDER, Landis 6"x18" Hyd. Cyl. late type, M.D.
GRINDER, Sellers Type #1A Tool, 24" wheel.
GRINDER, 37" Wheel Dia. Osterheim Disc, 24" cap.
GRINDER, 30" Ingersoll Tub Face Mill, M.D.
GRINDER #79-72" Gardner Vert. Spindle, Late.
PROFILE GRINDER, Studer Type PSM, M.D., late.
GEAR SHAPER, Fellows #6 High Speed, M.D.
GEAR SHAPER, Fellows #7 High Speed, M.D.

HAMMER, Rochester Hispeed, all sizes, M.D.
HAMMER, Bradley 200# Rubber Cushioned Helve.
HEADER, Manville #1 S.S.S.D. Cold 5/16".
INDUCTION HEATER, 16 KVA Ecco Hi Frequency.
INDUCTION HEATER, 36 KW Lepel, Late Type
AIR MOTOR HOIST, Ingersoll Rand 2000# cap.
ELECTRIC HOISTS, 500-4000 lbs. Whiting, NEW.
HONE, #194 Barnes Vertical, M.D., Hyd. Late.

KEYSEATER, #5 Mitts & Merrill, Giant, M.D.
LAPPER, 2F Norton Vert., M.D., late type.

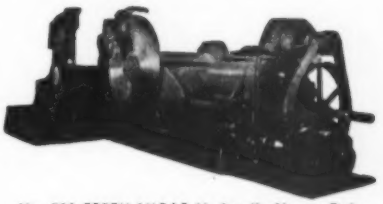
DISC GRINDERS
Osterheim 37" Wheel Diameter Disc Grinder. 40 HP. TEFC 3/60/440 spindle motor drive. 24" capacity.



#4 WARNER & SWASEY Geared Head Turret Lathe, Motor Driven, Bar Feed, Taper Attachment.

LATHE, Se-Swing 8"x106", M.D., A.C. Rebuilt.
LATHE, Porter-Cable 9'x15" Geared Head Prod.
LATHE, Hendey 12"x5' Q.C.G. Taper Attach. M.D.
LATHE, LeBlond 14"x6', Q.C.G., M.D.
LATHE, Hendey 14"x8' Q.C.G. Taper Attach. M.D.
LATHE, Lodge & Shipley 16"x6', Q.C.G., Grd. Hd.
LATHE, American 16"x6' Q.C.G., Grd. Hd. M.D.
LATHE, Lehman 16"x7' Q.C.G., M.D.
LATHE, American 16"x10' Q.C.G., Grd. Hd.
LATHE, South Bend 18/28"x8' Gap Bed, Q.C.G. M.D.
LATHE, Hendey 20"x10' Q.C.G., Taper Att. M.D.
LATHE, Read-Prentice 26"x10' Grd. Hd. M.D.
LATHE, LeBlond 22"x10' Q.C.G., M.D.
LATHE, 24"x12' Boye & Emmes Gd. Hd., T.A., Late.
LATHE, Putnam 23/32"x12' Q.C.G., M.D.
LATHE, LeBlond 24"x14' Q.C.G., Grd. Hd.
LATHE, Lodge & Shipley 26"x14', Q.C.G., M.D.
LATHE, McCabe 26/46"x18' Double Spindle Lathe.
LATHE, Bridgeford 27"x12' Geared Head, M.D.
LATHE, 27"x16' Niles Timesaver, Grd. Hd., M.D.
LATHE, Bridgeford 32"x16' Q.C.G., Grd. Hd.
LATHE, 42"x18' Pittsburgh Geared Head, M.D.
LATHE, Buffing Dble. End #VMT5, Devine Bros.
LATHE, Turret #1 Bardons & Oliver Electric Head.
LATHE, Turret, #2 Simmons Vari Drive 220 V.
LATHE, Turret #2 W & S Univ. Grd. Hd., Late.
LATHE, Turret, #4 Warner & Swasey Univ. 1½".
LATHE, Turret #6 Warner & Swasey Grd. Hd. Ram Type, Bar Feed, Motor in base.
LATHE, Turret #2 Cincl. Acme Univ. Geared Head.
LATHE, Turret, #3A Warner & Swasey Univ. M.D.
LIFT TRUCKS, Baker 1 & 2 ton, Platform & Fork.

MILL, #4 Burke Motor Driven, Late, M.D.
MILL, #2 Pratt & Whitney Prod. Duplex, M.D.
MILL, #4B Brown & Sharpe H.D., Horiz. M.D.
MILL, #14 Garvin Plain Horiz., M.D.
MILL, #0Y Brown & Sharpe Plain Horiz., M.D.
MILLING MACHINE, #2B K & T Horiz., M.D.
MILL, Cincl. Horiz. #3, #4, #5 High Power, M.D.
MILL, #1 Brown & Sharpe Plain Horiz., M.D.
MILL, #0-S Cincl. Vert. Prod. Late, M.D.
MLUT-MILLER, U.S. Tool #MM-1-6 Auto. Prod.
MILL, #0 Vernon Hand Mill, M.D., Late.
MILL, 2A Brown & Sharpe Horiz. Univ., M.D.
MILL, #2SP Van Norman Horiz. M.D., Late.



No. 700 ESPEN LUCAS Hydraulic Heavy Duty Cut-off Saw, new 1945.

MILLING MACHINE, Kempsmith #2 Horiz. Univ.
MILL, #3 Cinc. Univ. Horiz., M.D.
MILLING MACHINE, LeBlond #4 Horiz. Univ.
MILL, #2 Vert. M.D. Brown & Sharpe.
MILL, #3 Cincl. Vertical HI Power, M.D.
MILL, #5C Becker Vert. Die Sinker, M.D.
MILLING MACHINE, #2 Van Norman Duplex, M.D.
MOTOR GENERATOR SET, Gen. Electric, 100 K.W.

NIBBLER, Gray Turret Type ¼"x24" cap. M.D.
THREADING, Staybolt Lassiter Millholland 1½".
THREAD MILL, 7½x11 Hansen-Whitney, Univ.
THREAD MILL, 6x14 Pratt & Whitney No. 1105.
THREAD MILLER, Lees-Bradner #40A Automatic.
THREAD MILLER, Plan-O-Mill #3 Planetary Form & Thread Semi-Automatic Milling Machine, Late.

PAPER SHREDDER, No. 10 Mitts & Merrill, M.D.
PLANER, Cincinnati 36"x36"x12' A.C., M.D.
POWER PRESS, Bliss #164 Open Back, M.D.
POWER PRESS, Bliss #3A S.S. Dble. Crank Grd. 45 tons, 4" stroke, 36"x26" Bed Area, M.D.
POWER PRESS—Bliss-Consolidated #163-B Straight Side Dble. Crank 45 tons, M.D.
PRESS #5 Johnson OBI, 56 tons, new.
PRESS, #7A Thomas O.B.I. 80 ton cap.
PRESS, #163 Toledo Toggle Drawing, M.D.
PRESS, 135 ton Clearing Single Crank 8" Str., Late.
PRESS, 70H Drake Hyd. Arbor, New.
PRESS, #78½ Bliss S.S. 9½ Str. M.D.
PRESS, Federal #2 O.B.I. Grd. 2" Stro.
PRESS, Bliss #18, #19, #20, #21, OBI, A.C., M.D.
PRESS, Waterbury-Farrel High Speed 60 tons #3W.
PRESS, 68 C Bliss Double Action, 3 crank.
PRESS, Lucas 15 tons Power Arbor, M.D.
PRESS, #68 Whitney Deep Thr. 24", foot.
PRESS, P2, P3 Ferracute M.D. Roll feed.
PANTOGRAPH, #1A Gorton M.D. Engraving.
PUNCH, #46 Buffalo Forge Vert. Cap. 1"x1½" M..D
PUNCH, R-4 Wiedemann Turret, 10 Stat. 24" thr.
PUNCH, Hecker Turret, 6 station, cap. 2½" hole.
PUNCH, H & J #2 Sgle. End. 24" Thr. 1" thru 1".
PUNCH, H & J #5 Sgle. end. 48" Thr. 2" thru 1½".

RIVET SETTER, ⅝" cap. Penn. Tubular Rivet.
ROLLS, Bertsch Pyramid 18'x1½" cap., M.D., Late.
ROLLS, #1 Buffalo Forge Wrapping, M.D.
ROLLS, 72"x¼" Lown Initial M.D., New.
ROLLS, #2 Buffalo Forge Vert. Angle, Bending, New.

COLD SAW, Wagner 10"x10" cap., M.D.
COLD SAW, Espen-Lucas #700, 48" dia. blade, M.D.
CUT-OFF SAW, Yates-American #M-90, M.D.
SAW, #4B Marvel Hack Saw 6"x6" Cap., M.D.
SAW, #20-C Racine Shear Cut 6"x6" cap., M.D.
SAW, Band, Tannewitz GH-36" High Speed, M.D.
SAW, V-26 DoAll Contour Band, Late.
SHAPER, 16" Pratt & Whitney Crank, M.D.
SHAPER, 20" Rockford Univ. M.D., Tilting Table.
SHAPER, G & E 24", high duty, back geared, M.D.
SHAPER, 32" Cincl. B.G., Motor driven, M.D.
SHAPER, Morton 36" Draw-Cut, 4-Speed, M.D.
SHEAR, #642 Niagara 42"x½" cap., 15° cap., M.D.
SHEAR, #26 Buffalo Forge Slitting Armor Plate.
SHEAR, Quickwork #11 Rotary 60" Throat, 10 ga.
SHEAR, #8E Niagara M.D. 8'x3/16" cap. M.D.
SCREW SLOTTER, #2 Waterbury Farrel Auto. M.D.
SCREW SLOTTER, #117 Kent, M.D., Late.
SLOTTER, 12" New Haven Vertical, M.D.
SPRU CUTTER, Milwaukee 56 tons, 2½ cap. M.D.
SURFACE PLATES & TABLES, all sizes.

TAPPER #1 CAM Haskins, Motor Driven, Late.
TAPPER, #1 Bakewell (Warner & Swasey) Late.
BRINELL, Tester Machine, Type UK300M, Steel City.
BRINELL, Tester Machine, Type 03DR, Steel City.

WELDER, 500 amp. Westinghouse Flexarc A.C.
WELDER, 200 & 400 amps. Gen. Elec. Portable Arc.
WELDER, 200 KVA Federal, Projection.
WELDER, 75 KVA Federal, M.D., Spot.
WIRE STITCHER, Merrion and Acme, M.D.

OVER 2000 MACHINE TOOLS AVAILABLE IN STOCK

HEADLINERS

MILLING MACHINES
No. 1-14 Kent-Owens Hydraulic, late
No. 3A Brown & Sharpe Universal
No. 4 Cincinnati High Power Universal
No. 4B Heavy Brown & Sharpe Plain
48" Cincinnati Plain Automatic

LATHES
12"x84" centers American 12-speed Grd. Hd., taper
14"x30" ctrs Lodge & Shipley Selec. Grd. Hd.
16"x30" ctrs Lodge & Shipley Selec. Grd. Hd.
21"x136" ctrs LeBlond Hvy. Dty., Turner Drive, taper
24"x60" ctrs American Hvy. Pat. 12-speed Grd. Hd., taper
36"x96" centers Boye & Emmes, cone, taper
36"x120" centers American 12-speed Grd Hd., taper

PLANERS
24"x24"x6' Gray, A.C. M.D.
30"x30"x8' Cincinnati, a.c. m.d
36"x36"x10' Cincinnati, a.c. m.d.
42"x42"x16' Gray
42"x42"x14' Niles-Bement-Pond Hvy. Pat., box table, 4 heads
48"x48"x12' Niles-Bement-Pond, 4 heads

GRINDERS
No. 2 Brown & Sharpe Surface
10"x24" Landis Plain Self-cont., m.d.
10"x18" Norton Plain, m.d.
No. 49—53" Besly Vert. Spdle. Surface, m.d.
No. 2 Norton Motor Driven Universal Tool & Cutter

GEAR MACHINERY
No. 1 Whiton Spur & Bevel
#3-36 Brown & Sharpe, A.C. M.D.
No. 2 Barber-Colman Hobber, m.d.
No. 5A Cincinnati 60"x16" Cutter
No. 12 Barber-Colman Hobber, m.d.
No. 18HM Gould & Eberhardt Double Spindle Hobber, s.p.d.
No. 18-H Gould & Eberhardt Hobber, a.c. m.d.
6", 11" & 18" Gleason Bevel Gear Generators
18" Gleason Bevel Gear Tester
No. 7 Fellows High Speed Shaper, m.d.
12" Gleason Bevel Gear Planer, cone

RADIAL DRILLS
6'-16" col. American "Triple Purpose", m.d.
7'-17" col. Dreses, m.d.

PUNCH PRESSES
No. 2 VKV, O.B.I.
No. A4 Robinson O.B.I., m.d., 56-tons
No. 77 Toledo Open Back, b.d.
No. 5H Cleveland Horning, arr. m.d.

MISCELLANEOUS
6" Cox Pipe Machine, m.d.
7"x7" Peerless "Mechani-Cut" Hack Saw, late
10" Dill Slotter, m.d.
20", 24", 28" Gould & Eberhardt Shapers
No. 14½ W&W Punch & Shear
Class F Bertsch Punch & Shear
1¼" Landis 2-spdl. Bolt Thrd., m.d.
2¼" Landis Long Bed Stay Bolt Threader, cone, leadscrew

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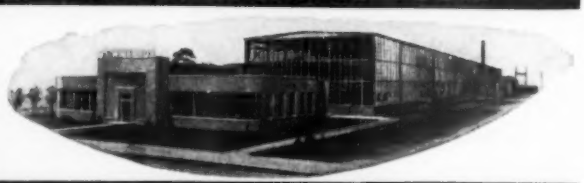

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CAM MILLERS

VAN NORMAN: 10CT Contour Miller, horizontal opposed spindle type for milling flat cams, also can be converted to similar work

CUTTER & TOOL GRINDERS

FELLOWS: Flat Top Helical Gear Cutter Grinder
OLIVER: 10" Template Tool Bit
RANSOM: 2-Wheel Grinder 3 HP
RUSSELL: 40" Saw Sharpener (New), automatic indexing

DRILLING MACHINES

ALLEN: #2 High Speed, 15" overhang
CINCINNATI-BICKFORD: 1¼" upright
PRATT & WHITNEY: ½B x 50 Deep Hole Reaming Machine

GEAR CUTTING MACHINES

BROWN & SHARPE: No. 6 Gear Cutter, 72" diameter, 1¾ D. P. capacity
CLEVELAND: Model 130 Gear Hobber (like new)
CLEVELAND: Model 140 Gear Hobber (like new)
FELLOWS: 61A Shaper, 18" dia.
FELLOWS: 64A Shaper, 18" dia.
FELLOWS: 72 Shaper, 7" dia.
FELLOWS: Flat Top Helical Gear Cutter Grinder
FELLOWS: Straight Line Generator, 3" dia. with many cutters
GLEASON: #12 Rough & Finish Gen.
GLEASON: 3" Straight Bevel Gear
GOULD & EBERHARDT 96", Universal, motor-driven
SYKES: Gear Shaper 14" external, 20" internal (New)
SYKES: Rack Cutting Machine 12" to 36" length capacity (New)

GEAR AND SPLINE GRINDERS

PRATT & WHITNEY: 10" single and double wheel, hydraulic feed
GEAR GRIND MACH: GG-19, 10"x 24" Hydr. Spur Gears and Splines

GEAR FINISHERS & TESTERS

FELLOWS: 8 LSI and 13 LSI Gear Lappers, external and internal spur and helical
FELLOWS: #12C Cone & Spacing Inspection Instrument
GLEASON: No. 4 and No. 6 Bevel Gear Testers. Hand and Power
NATIONAL BROACH: SIC-12" Red Ring Gear Testing Machine

GRINDERS—CYLINDRICAL

BROWN & SHARPE: No. 10 capacity 6"x18" plain
CINCINNATI, 6"x18" Hydraulic, Plain
LANDIS: 16x32" Type "D" Crankpin, hydraulic, for grinding crankshafts
LIDKOPING: Centerless (New)
NORTON: 10"x18" 45° angle wheel

GRINDERS—GEAR & SPLINE

GEAR GRIND MACH.: GG-19, 10"x 24" Hydr. Spur Gears and Splines
PRATT & WHITNEY: 10" single and double wheel, hydraulic feed

GRINDERS—INTERNAL

BRYANT: No. 5Y Internal
BRYANT: 16C16 Hole, Hydraulic
HEALD: 72A3 Sizematic Centerless

GRINDERS—RADIUS

VAN NORMAN: #73, capacity 7½"
VAN NORMAN: #639, capacity 7"
VAN NORMAN: #649, capacity 6" to 16" diameter
VAN NORMAN: #3½ Un. Radius

GRINDERS—SURFACE

ARTER: A-1—8" Rotary
HEALD: 8" Rotary
HEALD: No. 22 Rotary—12" Chuck

GRINDERS—THREAD

EXCELLO: #31 External, dia. 5"x18"
JONES & LAMSON: #636 Universal, 6" dia. x 36" centers and one extra multiform wheel dressing attachment

HONING MACHINES

BARNES: No. 306H Vertical 24" Stroke
MICROMATIC: H-510 Double End Horizontal, ¾" to 2" dia.
MICROMATIC: H-2 Single End Horizontal, 2-spindle, ¼" to 1" dia.

JIG BORING MACHINES

PRATT & WHITNEY #1 Jig Borer
SWISS #5B Jig Borer
LINDNER #14 & #15 Jig Borer, new

LAPPING MACHINES

FELLOWS: 8LSI and 13 LSI Gear Lappers, external and internal spur and helical
NORTON: No. 26 Hyprolaps, for flat work & Cylindrical lapping

LATHES PRODUCTION

BLOUNT: Polishing speed lathe 12" dia. x 48" centers
REINECKER Relieving Lathe (new)
H.E.B.: High production hydraulic duplicating and copying lathes (new)
LE BLOND: Regal, 15" swing x 42" centers
LODGE & SHIPLEY: #3A Duomatic. 25½" swing x 27" centers
MONARCH MONOMATIC: 14"x48" Copying Lathe, with air tracer
30"x23' Centers, latest type, new engine lathe
POTTER & JOHNSTON: #6 DREL Automatic
PROGRESS: Geared head 16" to 30" swing (New)
TRIPLEX: 14" dia. x 40" centers Toolroom Lathes (new)
VDE New Engine Lathe 49" swing x 20' centers
VDE New Engine Lathe 27" swing x 23' centers

LATHES—TURRET

SCHIESS: 41", 65" and 79" Vertical Turret Lathes (New)
WARNER & SWASEY 2A Turret Lathe
WARNER & SWASEY #3 Turret Lathe
BULLARD: 84" Vertical Turret Lathe
HERBERT: #2, #4, #7, and #8 Sizes (new)
WEBSTER & BENNETT: Vertical Turret Lathes 36" & 48" (New)

MILLING MACHINES

TAYLOR-FENN: M-80 Duplex Spline
RICE-BARTON: Duplex Spline
VAN NORMAN: 10CT Contour Miller, horizontal opposed spindle type for milling flat cams, also can be converted to similar work

PRESSES

Gen. FLEX: Screw Press, 3 ton
LOGAN: 5-Ton Vertical Hydraulic Press

SAWS & CUT-OFF MACHINES

CAMPBELL: No. 425 Cutalator Abrasive Cut-Off, 4½" dia. capacity
MOTCH & MERRYWEATHER: No. 3 Circular Saw with auto. stock feed
RUSSELL: 9½" cut-off Saw with Auto. Stock Feed (New) Hydraulic
RUSSELL: 5½" dia. cut-off saws, auto stock feed, hydraulic (New)

SHAPERS

HERCULES: 16" & 22" Shapers (New)
KLOPP: 16" to 26½" Shapers (New)

THREAD MILLERS & TAPPERS

HALL PLANETARY: Model "D" Thread Miller
LANDIS: 2½" single head horiz. threading machine
LEES-BRADNER: 40A Thread Miller
MURCHEY: #22 Horizontal threading and tapping machine, ½" to 2½" dia. capacity, single spindle
NATCO: Vertical Tapper 16 spindle

WIRE FORMING MACHINES

BAIRD: 4-slide wire former
HEENAN & FROUDE: Wire forming, 4-slide machines (new)

MISCELLANEOUS

CUTOFF: Campbell, abrasive 425 Cutalator 4½" dia. Capacity
RACK CUTTING MACHINE: Sykes 12" to 36" length capacity (New)
CUT-OFF: Russell 5½ & 9½" cut-off saws with auto. stock feed (new) hydraulic
PRESS: Screw. Gen. Flex. 3 ton
TEST STAND: Denison 918-AM Hyd.
LATHES: Blount Polishing Speed Lathe, 12" dia. x 48" centers
GOGAN BRINELL Hardness Tester Model 16-J
SHAPERS: Klopp 16 to 26½" (New)
SHAPERS: Hercules 16" & 22" (New)
SUNDSTRAND: 44" Double End Centering Machine
WIRE FORMING MACHINES: 4-slides (new)

INSPECTION INVITED — Telephone HAnover 2-4520

TRIPLEX MACHINE TOOL CORP.

75A West Street, New York 6, New York **Cable Address TRIMACTOOL**

MACHINE TOOL ENGINEERS SINCE 1919

HARVEY GOLDMAN PRESENTS

This Trade Mark Stands For:

- THE FINEST MACHINE TOOLS
- 3 GENERATIONS OF EXPERIENCE
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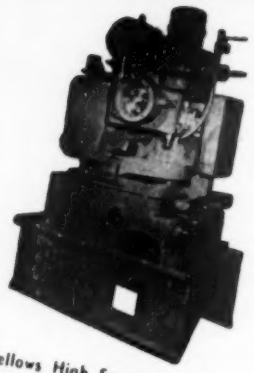
CONSULT US WHEN YOU WANT THE BEST!

- AUTOMATICS
- BROACHES
- DRILLS
- GRINDERS
- LATHES
- MILLS
- PLANERS
- PRESSES
- SHAPERS
- MISCELLANEOUS

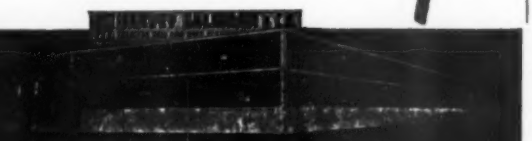
FOR IMMEDIATE DELIVERY



Type 27 Fellows High Speed Gear Shaper suitable for both spur and helical internal and external gears.

Reconditioned, fully guaranteed.

Available for immediate delivery.



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TELEPHONE: TIFFANY 6-4450

THE FOCAL POINT FOR PRODUCTION MACHINERY

TAVANNES "GYROMATIC"

Max. diameter of bar—1⅝"

Max. turning length—6"

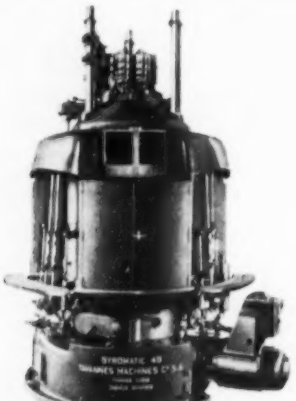
31 spindle speeds from 194 to 1500 rpm

25 feeds

Production rate—31 to 642 pcs. per hour

Equipped with collant pump, piping, splash guards, 6 tool slides with toolholders, assortment of change gears and collets

Arranged for motor drive including 15 HP, 220/440 volt, 3 phase, 60 cycle motor and electrical starting equipment



#40 6-SPINDLE AUTOMATIC SCREW MACHINE

Net weight approx—11,000#; Gross approx—13,100#

CONDITION

LATE TYPE, excellent condition, ready for immediate service.

DELIVERY

From stock, subject to prior sale.

BULLARD 42" SPIRAL DRIVE VERTICAL TURRET LATHE

Capacity—44" diameter; 33" in height under cross rail; 43½ under turret face; 4 jar Independent chuck, diameter of chuck 42⅜" in diameter.

Feed changes—Independent feed works for each head provided, 8 changes ranging from .011 to ½" in all directions.

Vertical head—Vertical movement of 27" will face 44"; will Swivel 45°; Horizontal movement—21" top of table to underside of side head slide—25".

30 HP, 3 phase, 60 cycle, 220/440 volt motor and controls.

LEBLOND QUICK CHANGE GEARED HEAD LATHE

1943 MACHINE — LIKE NEW

48" x 35' between centers, 28½ over carriage.

2 piece bed.

Factory motor drive and controls.

3¼" hole through spindle.

27 spiral speeds.

2 carriages each with compound and tapered attachments

44" 4 jaw face plate chuck, steady & follow rest.

CROWN MACHINERY EXCHANGE

NEW AND USED MACHINERY

CANAL 6-1254

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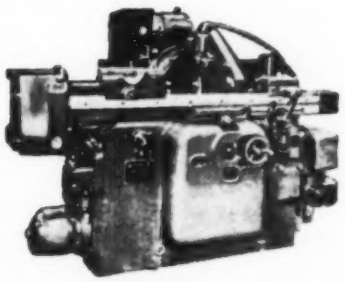
NEW YORK 12, NEW YORK

NEW and LATEST TYPE REBUILT MACHINE TOOLS FOR SALE or LEASE

LATHES

MONARCH Model EE 10"x20" Toolroom Lathes
MONARCH Model N G.H. Engine Lathe 33½"x120" cc
LODGE & SHIPLEY G.H. Engine Lathe 24"-27"x16' cc
AMERICAN G.H. Engine Lathe 24"-27"x96" cc
AXELSON G.H. 24-Sp. Engine Lathe 16"x54" cc
LEHMANN G.H. 16-Sp. Engine Lathe 18"-20"x82" cc
AMERICAN G.H. Engine Lathe 16"-18½"x36" cc
MONARCH Model 3T Multi-Tool Mfg. Lathe 12"x18" cc
HARDINGE 2nd Operation Lathe 1" Cap.



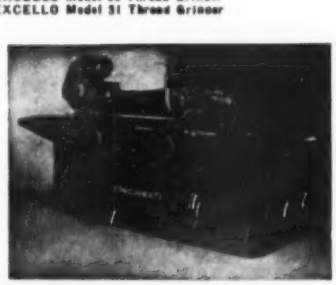
JONES & LAMSON MODEL TG 12 x 45"
AUTOMATIC THREAD GRINDER

TURRET LATHES

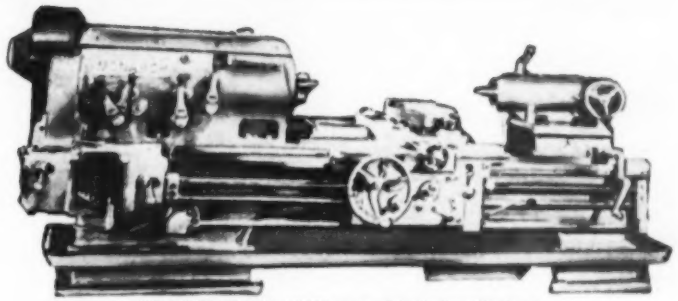
WARNER & SWASEY Mod. 2 G.H. Ram Type 1" Cap.
WARNER & SWASEY Mod. 2 G.H. Ram Type 1½" Cap.
BARDONS & OLIVER Mod. 2 G.H. Ram Type 1" Cap.
BARDONS & OLIVER Mod 3 G.H. Ram Type 1½" Cap.
WARNER & SWASEY Mod 3 G.H. Ram Type 1½" Cap
GISHOLT Mod 3 G.H. Ram Type 1½" Cap.
WARNER & SWASEY Mod 5 G.H. Ram Type 2½" Cap.
GISHOLT Mod 5 G.H. Ram Type 2½" Cap.
FOSTER Mod 1B Univ. G.H. Saddle Type 2-9 1/16" Cap.

GRINDERS

BROWN & SHARPE Model 2 Internal-External Universal Grinder 14"x30" Cap.
CINCINNATI Uni. Hydr. Cyl. Int.-Ext. Grinder 12"x 36" Cap.
ROTOREX Model 101-A Universal T & C Grinder, w/Int. Att.
COVEL Model 9IA Univ. T & C Grinder
JONES & LAMSON Model TG-12x45" Auto. Thread Grinder
EXCELLO Model 35 Thread Grinder
EXCELLO Model 31 Thread Grinder



CINCINNATI 12" x 36" HYDRAULIC UNIVERSAL GRINDING MACHINE INT. EXT.



MONARCH 33½" x 120" ENGINE LATHE—MODEL N

LAPPING MACHINES

ULTRALAP Model 10 Vert. Lapper

TAPPING MACHINES

BAKEWELL Model 2 Tapper ⅜"—2½" Cap.

MILLING MACHINES (Horizontal)

VAN NORMAN Model 36 Ram Type Duplex
NEW CENTEC Model 2A Universal With Vert. Att.
MILWAUKEE No. 1-B Universal Miller
BROWN & SHARPE Mod 10 Auto. Production Miller
CINCINNATI Mod 08 Plain Horiz. Auto., Cycle

MILLING MACHINES (Thread)

PRATT & WHITNEY Model C-M-1804 Thread Miller 4½"x36"
HANSON & WHITNEY Univ. Semi-Auto. Thread Miller 10"x48"

HANSON & WHITNEY UNIVERSAL SEMI-AUTOMATIC THREAD MILLING MACHINE
10" x 48"

MISCELANEOUS

FAMCO #6, 8, 10, 12, 15 Foot Presses (NEW)
EXCELSIOR #6, 8, 10, 12, 15 Foot Presses (NEW)
ARBOR PRESSES (NEW)

VERTICAL MILLER

GORTON Model 8D Super Speed Vertical Miller

PRESSES

WIEDEMANN Model R11P 16 Sta. Power Turret Punch
RUESCH #2 Percussion Press
POWER PRESSES (New)

AUTOMATICS

BROWN & SHARPE Model 00G ⅝" Cap.
CLEVELAND Model A Single Spindle 9/16" Cap.
CLEVELAND Model A Single Spindle 1-1/16" Cap.
CLEVELAND Model A 1¼" Cap.
CLEVELAND Model B Single Spindle 1½"—1⅝" Cap.

BORE-MATICS

EXCELLO Model 2112A Single End Double Spindle Hyd. Cross Slide Table

DRILLS

NEW O. M. S. R. Type T.B. 2 Radial 4'x12" Column
NEW ZEWO Universal Floor Type Radial 21"x½"
NEW CANEDY OTTO 18" Single Spindle ⅝" Cap.
NEW FAMCO 15" Bench Type Drill Presses ½" Cap.
NEW FAMCO 15" Floor Type Drill Presses ½" Cap.
MORRIS MOR-SPEED RADIAL 3'x9" Column
LELAND GIFFORD 2 Spindle 20" Drill Press

GEAR EQUIPMENT

BARBER-COLMAN Type S Gear Hobber
FELLOWS 3" Fine Pitch Shaper
GLEASON 12" Straight Bevel Generator—Finisher—Rougher
GLEASON 3" Straight Bevel Generator
GLEASON 3" Spiral Bevel Gear Generator
GLEASON 3" Bevel Gear Tester
GLEASON Model 0 Angular Hypoid Tester
GLEASON 10" Spiral Bevel Generator
BARBER-COLMAN Model 12 Hobber 12" Cap.

PROFILERS

PRATT & WHITNEY 40-Inch Profilor 2 Side Heads
PRATT & WHITNEY 30" Single Spindle

SHAPERS

HENDEY Universal H.S. Crank Shaper 12"
GOULD & EBERHARDT Industrial Shaper 20"

SHEARS

COLUMBIA 92"x¼" Cap. 18" Gap Power Shear
PEXTO 44" Geared Power Gap Shear
NIAGARA Model 412 Power Shear 12'x16 Gauge

NIAGARA #412 POWER SQUARING SHEAR
12' x 16 GAUGE

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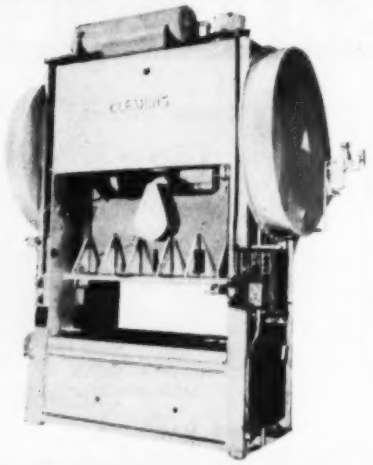

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STRAIGHT SIDE
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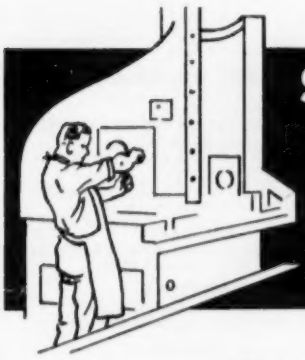

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DOLLARS

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Stretching your machine tool dollars today is quite a big task, but Worcester Automatic Rebuilding Company has been doing it for a long, long time. They can take your old machine, strip it down to the bare casting — clean it — replace worn parts and refinish sliding surfaces like new again. The entire job from start to finish is done by skilled workmen and engineers. All machines are carefully tested and guaranteed. The complete *engineered* rebuilding job cost less and cuts down your waiting time.

Don't slow up your production because of long delivery dates — check your old equipment and call us.

Send us a list of your machines that need rebuilding to meet new problems. We will be glad to quote phase 1 and 2. Simply write to address below and we will promptly reply.

Precision Machine Tool Rebuilding • Motor Drive Engineering

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BEMENT MILES 18" SLOTTER with 3" dia. spindle. M.D.

GOULD & EBERHARD 36" Gear Cutter M.D.

BROWN & SHARPE #5—48" Gear Cutter, M.D.

BINSEE MACHINERY COMPANY HORIZONTAL BORING MILL. Table 30"x 64". Quantity of boring bars.

GRAY 36"x36"x8' Planer, 2 heads on cross rail; motor driven. Thoroughly rebuilt and guaranteed.

FOOTE-BURT #25—24" Heavy duty Vertical Drill #5 M.T. Motorized.

LANDIS 10"x36" Plain, M.D. Also Planer type GRINDER 16" x 36".

"BEMENT" 26" STROKE TRAVERSING HEAD SHAPER. 48" travel to ram. 2 tables. (PLANER SHAPER)

WE HAVE A LARGE STOCK FROM WHICH TO SELECT. TELL US WHAT YOU WANT.

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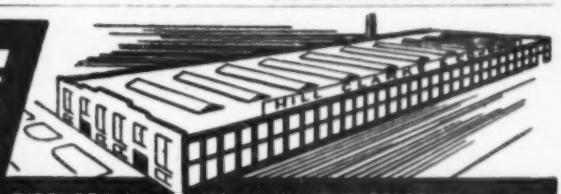
P. O. Box 88 Columbus 16, Ohio

HILL-CLARKE MACHINERY COMPANY



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THE MAYTAG COMPANY REPORTS TWO-THIRDS GREATER PRODUCTION, easier operation and less maintenance, required with this Hill-Clarke rebuilt lathe. For 38 years MAYTAG has relied on Hill-Clarke for good, dependable used machines like this recess lathe used to center bottom of washer tub so that agitator has same all around bottom clearance.

MILLING MACHINES

54"x30"x16' Ingersoll Slab Mill
6"x168" Pratt & Whitney Thrd. Mill
10"x48" Hanson-Whitney (1942)
12"x102" Lees Bradner Thrd. Mill

PLANERS

36"x36"x12' Cincinnati, 2 hds.
36"x36"x12' Gray, 2 hds.
42"x42"x10' Cincinnati, 2 hds.
48"x36"x14' Gray, 2 hds.
48"x48"x12' Cincinnati, 2 hds.
48"x48"x12' Gray Maxi-Service
60"x48"x27' American, 4 hds.

MISCELLANEOUS

1"-2" Dia. Cap. Micro. Hor. Hone—#200
¼"-1" Dia. Cap. Micro. Hor. Hone—#H-2
42"—18 gage Economy Power Shear
75 Ton R & K Straight Side Press
3 Ton Fox Hydraulic Press
2—12"x96" Magnetic Chucks
20'x1" cap Southwark Roll
14'x¾" cap Niles-B-Pond Roll
15" Dill Slotter
18" Dill Slotter
38" Morton Draw-Cut Shaper (1945)
No. 0 Bakewell Tapper

FULL MONEY-BACK GUARANTEE

1. **Hill-Clarke gives you an unconditional money-back guarantee.**
2. **All machines in stock.**
3. **You can see your machine run and tested under power in our plant before purchasing.**
4. **Complete and modern facilities plus experienced craftsmen for REMANUFACTURING machine tools in our 58,000 sq. ft. plant.**
5. **A responsible organization — with 85 years' experience.**

AUTOMATICS

1-1/16" Model A Cleveland (1942)

DRILLS

1 Spdl—15" Sw—No. 2 Avey, Cam Fd.
1—Spdl—24" Sw—No. 2 MA6 Avey
2 Spdl—24" Sw—No. 2 Aveymatic
2 Spdl—24" Sw—No. 3 Avey
D-31 Fox Multiple Drill, No. 2 Taper.
6' Western Radial

GEAR MACHINES

No. 12HS Gould & Eberhardt Hobber
11" Gleason Bevel Gear Generator
No. 64 Fellows Gear Shaper
No. 36-BM G & E 3 Spdl, Rougher
No. 612-A Fellows Gear Shaper
No. 615-A Fellows Gear Shaper
No. 65 Fellows—Cone Dr.
8" cap Red Ring Gear Lapper

LATHES

12"x21" Fay Automatic
13¾"x39" Centers Dimco Lathe (New)
15"x39" Centers Dimco Lathe (New)
18"x59" Centers Dimco Lathe (New)
23"x60" Centers Dimco Lathe (New)
24"x39" Centers Dimco Lathe (New)
19"x8' LeBlond Hvy. Duty Lathe
36"x18' Putnam Grd. Hd., M.D.
No. 4R Libby Turret (1942)
No. 4 Warner & Swasey Tur.-Bar Fd.
5W Acme Ram type Tur., 2" Capacity
No. 6 Warner & Swasey Tur.-Bar Fd.
18" Libby Tur. Lathe, M.D.
No. 3AL Gisholt
No. 4A Warner & Swasey—7⅛" Hole—Spdl.

GRINDERS

6"x18" Norton Cylindrical (1943)
Hill-Clarke Norton Type Motor Driven Grinders
10"x36" centers
10"x50" centers
10"x72" centers
10"x96" centers
14"x36" centers
14"x72" centers
20"x96" centers
24"-32" Gap x 144" centers
No. A-3—12" Arter Rotary Surf.
5A Bryant Internal
5B Bryant Internal
No. 16-16 Bryant Internal Grd.
No. 16-28 Bryant Internal Grd.
No. 24-26 Bryant Internal Grd.
No. 81 Heald Centerless Internal
No. 74 Heald Internal Centerless

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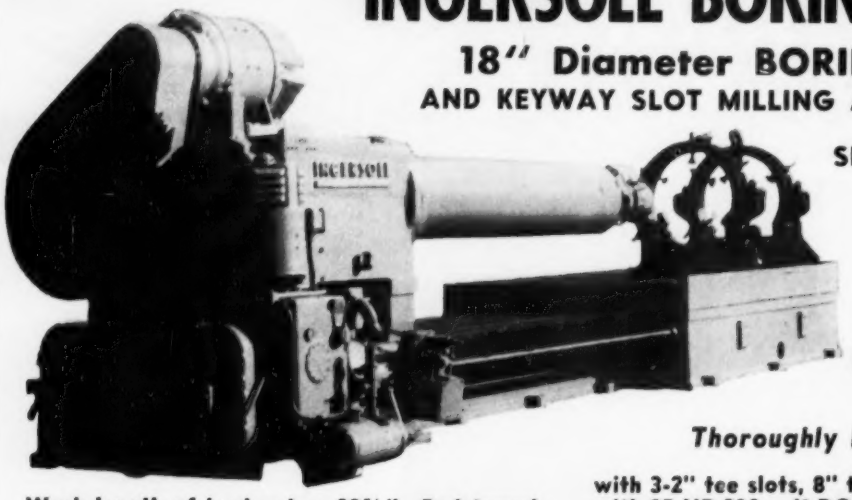
INGERSOLL BORING LATHE

18" Diameter BORING BAR
AND KEYWAY SLOT MILLING ATTACHMENT



SERIAL #16571—1943
complete
with
AUTOMATIC CONTROL PANEL

Thoroughly Reconditioned

Work length of boring bar 98⅜". Bed travel 125". Height of center line of boring bar over carriage 24". Over all bed length 327". Boring bar length 110". Work carriage 84" x 127" with 3-2" tee slots, 8" thick. Spindle powered with 25 HP 230 volt DC motor. Spindle speeds 6 to 47 RPM. Carriage feed .375 to 17.6 inches per min. Rapid return—222" (18'-6") per min. 7 cutter heads.

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6" x 48" Thompson Hydraulic Broach Grinder.

Cleveland 6 Spindle Automatic Chucker, 4¾" capacity.

Leland-Gifford 2LMS 6 Spindle Drill Press with back gears and power feed to all spindles.

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2—Herbert Universal Turret Lathes #9S #4
2—Bardons & Oliver Turret Lathes #7 #5
3—Cincinnati Vert. Mills #0-8
2—Girards Radial Drills 3 ft. 4 ft.
2—Double end Centering Machines 10x42
1—Jones & Lamson auto. Thread Grinder 636
1—Landis Hydr. Internal Grinder 15x8
1—Heald hydr. Surface Grinder 22
1—Arter Surface Grinder A-1-8
1—Logan hydr. Press, cap. 5 ton
2—Hi-speed V-Ram Shaper 20"

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BROWN & SHARPE Automatics (several)
#12 Martin Hydraulic Marking Machine
BAIRD Cut & Carry Drawing Press
4" RICE BARTON SPLINE MILLER
DIAL FEED POWER PRESSES
SHELL THREAD ROLLERS
30" ESPEN-LUCAS Hydraulic Cold Saw
¼" MANVILLE #1 D.S.S.D. Header
17" LE BLOND Lathe, Geared Head
#40 ANDERSON Dial Feed Tappers
#2A WARNER & SWASEY Turret Lathe
Numerous Other Machine Tools

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LATE MODEL TOOLS

American Type T-8-32 Broaches Three-way vertical hydraulic, single ram, 13"x18" table. Cap. 12,000#. MD with 7½ HP motor. 1942.

Barrett 1 ton Portable Shop Elevator Hinged type. Never used. Half price.

No. 320 "Barnesdril" Multiple Cyl. Hyd. Hone, throat—16¼", spindle stroke 2" to 20", 5" dia. spindle. Sleeves with #4 taper. 1948.

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new and used machinery

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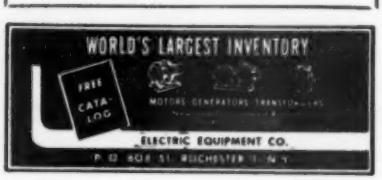
FELLOWS Gear Shaper

61-A Purchased New in 1943

WINSTON MACHINERY CO., INC.
326 West Ohio St. Indianapolis 2, Ind.



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for fine Machine Tools!

Morey has a MULTI-MILLION dollar stock of outstanding used and rebuilt machine tools. Over 1500 ready for immediate delivery!

LATHES	SURFACE GRINDERS	RADIAL DRILLS
BORING MACHINES	GRINDING MACHINES	HAND SCREW MACHINES
POWER PRESSES	IRONWORKERS	AUTOMATIC SCREW MACHINES
MILLING MACHINES	DRILLING MACHINES	

With these outstanding machines Morey offers more than 40 years experience, plus the full facilities of our engineering department, trained factory service men and a stock of spare parts and accessories.

MOREY also has NEW high grade European Machine Tools. Over $6,000,000.00 worth delivered to satisfied customers in the United States within the past ten months! Write today for full information.

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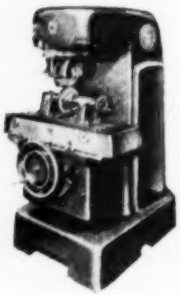
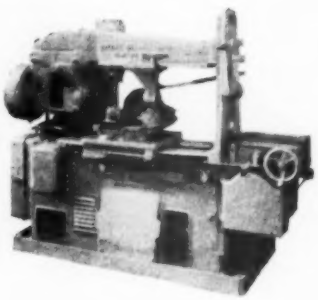
- **(3) UNEQUALED FACILITIES—for top guaranteed accuracy at lowest cost**
- **(4) MONEY-BACK GUARANTEE—we're proud of our work**

Check this beauty...

National Red Ring Gear Shaving machine, year of manufacture 1946. Complete with crowning attachment, coolant system, splash guard and electrical.



and this...



Two type A Barber Colman gear hobbers, year of manufacture 1945. Single thread index with large assortment of change gears.

AUTOMATICS

5/16" No. 00G Brown & Sharpe, serial No. 6370.

1¼" 8-spindle Conomatic, serial No. 1483CC.

2¾ to 3¾" Cleveland Model A, serial No. 33790, with motors.

8" 6-spindle Baird, Timken bearing chucker, front and rear slides, late type.

BROACHES

12 ton No. V 2 American vertical hydraulic, 24" stroke, push down, serial No. 825.

15 ton American horizontal hydraulic, new 1946, 48" stroke.

18 ton No. V 42 American hydraulic, serial No. 992.

No. 3XA Oilgear horizontal hydraulic, serial Nos. 2673, and 6896, 10 ton by 56" stroke.

DRILLS

20" Colburn No. 2 heavy duty manufacturing.

20" and 24" No. 217 Baker box column, heavy duty, several.

24" No. 321 Baker box column, heavy duty.

28" No. B250H Natco vertical hydraulic, serial No. B250H-17, 20" feed, No. 5 Morse taper.

No. 36-HO Baker vertical hydraulic, downward working with 36" dia. index table.

34-spindle No. A16 Natco, serial No. A16-948, 20"x38" bed.

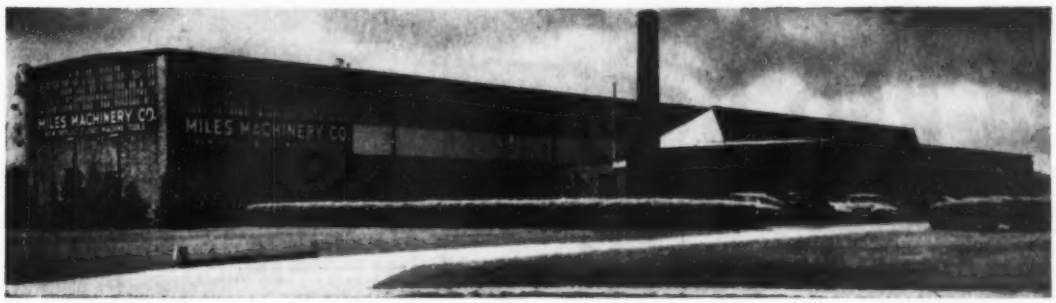
12" No. 1LMS Leland Gifford motor spindle sensitive drill, new in 1941.

15" No. 2 Allen single spindle sensitive drill, with lead screw tapping, serial No. HMT18713.

3½' arm by 8" column American sensitive radial drill, motor on arm, serial No. 54546.

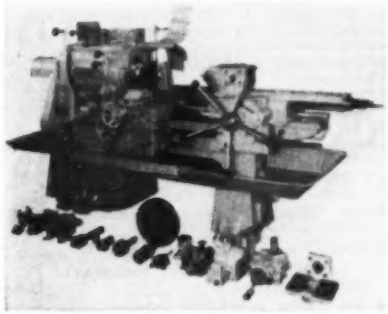
Model 7½AA-14 Baker 2-way hydraulic feed horizontal drill, with 5-way indexing fixture for drilling and lead screw tapping, new in 1947.

COMPLETE MACHINE TOOL SERVICE



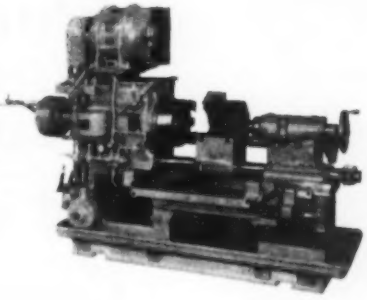
Main Rebuilding Plant

and this...



No. 5 Gisholt full universal turret lathe, year of manufacture 1943, with Timken bearings, hardened ways, 2-speed motor in base, bar feed, automatic chuck, master collet and many accessories.

and this



20" x 25" Fay automatic lathes, serial Nos. 81539 and 81761, year of manufacture 1942, with front and rear slides, electrical equipment, air chuck and cylinder.

GRINDERS

4" x 12" No. 4H Laudis, hydraulic, plunge cut, late type, plain.

10" x 18" Norton plunge cut, oscillating spindle, several.

23" No. 84 Gardner double spindle opposed horizontal disc grinder.

No. 72A3 Heald hydraulic internal grinder, late type.

No. 16A Blanchard automatic surface grinder, serial No. 1783, 30" magnetic chuck.

8" x 24 No. 78 Wilmarth & Morman surface grinder.

TURRET LATHES

1½" Oster Rapiduction hand turret, lathe, late model.

2¼" No. 6 Warner & Swasey, motor-in-base, geared head, power feed to turret in cross slide.

2½" No. 5W Acme universal, motor-in-base quick change geared head, Timken bearings, bar feed, late type.

3½" x 18" Libby International universal saddle type geared head, power rapid traverse on both carriages, motor drive.

36" Rogers vertical with side head, serial No. 1266, new in 1942.

36" Bullard New Era type, with cutting lubricant system, 3-jaw chuck table.

MILLS

No. 2 Kent Owens hand.

24" Cincinnati automatic duplex.

4-36 Cincinnati hydromatic bed type production miller, with new hydraulic system, rebuilt and first class.

Model M80 Taylor & Fenn duplex spline mills.

8" x 16" Hanson Whitney thread mill, new in 1941.

FOR COMPLETE LISTING, ASK FOR CATALOG NO. 195.

MACHINERY CO.

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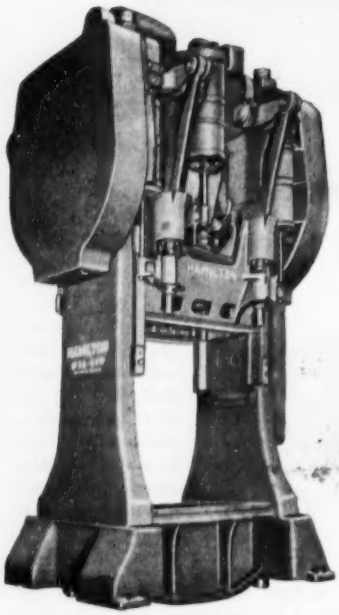
BOX 770 • SAGINAW, MICHIGAN

WATCH FOR THE *Emerman* 1953 RED BOOK



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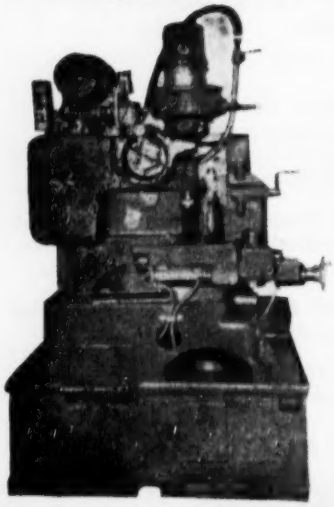
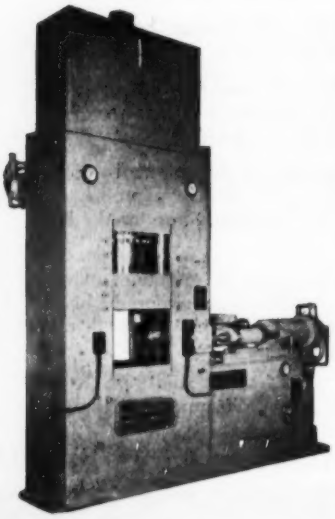
Be sure to get your Copy





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875 W. 120th STREET CHICAGO 43, ILLINOIS

FINE LATE TYPE GUARANTEED TOOLS

24"x84" centers BOYE & EMMES Heavy Duty Geared Head Engine Lathe, chuck, AC-MD.

25"/32"x96" centers AMERICAN Pacemaker Heavy Duty Engine Lathe, taper attachment, chucks, 25 HP AC motor, new 1948.

28"x15' centers BERTRAM (Niles patterns) "Timesaver" Engine Lathe, 2 carriages, rapid traverse, AC-MD, new 1943.

60"x20' NILES BEMENT POND Geared Head Engine Lathe, rapid traverse.

No. 3L GISHOLT Turret Lathe, 5-1/16" hole thru spindle, new 1943.

#2 BARDONS & OLIVER Turret Lathe, bar speed, 1¼" cap. New 1944.

No. 5 GISHOLT Universal Turret Lathe, preselector head, bar & chuck, new 1943.

42" BULLARD Spiral Drive Vertical Turret Lathe, Serial 23800, New 1944.

No. 3-24 CINCINNATI Plain Hydromatic Mill, AC-MD.

No. 4 KEARNEY & TRECKER Plain Horizontal Mill, No. 50 taper, motor in base, rapid traverse.

#4H KEARNEY & TRECKER Vertical Mill New 1944.

5'-13" column CARLTON Radial Drill, AC motor in arm, 15-1500 RPM, box table.

No. 914 BAKER Heavy Duty Hydraulic Drill, No. 6 Morse taper, 15 HP motor, new 1946.

25A HEALD Rotary Surface Grinder, 24" diameter magnetic chuck, AC-MD.

14"x36" LANDIS Universal Hydraulic Cylindrical Grinder, new 1943.

36" OHIO Dreadnaught Shaper, AC-MD.

1½" LANDIS Bolt Threader, leadscrews, AC-MD.

75 Ton HENRY & WRIGHT Double Crank Dieing Machine, roll feed & scrap cutter. No. 135 CLEVELAND Rigidhobber.

1¾" CLEVELAND Model "A" Automatic Screw Machine, new 1942.

V2—6 Ton, 26" stroke, AMERICAN Vertical Broach.

O'CONNELL MACHINERY CO.

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1695 GENESEE ST. BUFFALO 11, N.Y.

AIRCRAFT

Farnham Forming Rolls

Model 1558E

Capacity 15' x ⅝" Radius x .060 Duro.

Model 638

Capacity 6' x ⅜" Radius x 1/32 Duro.

Also—20' x 3/16".

Spar Mill

30' Onsrud A80. 4 Heads.

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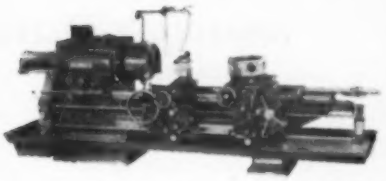
TRiangle 5-5237

LATE TYPE MACHINE TOOLS



No. 1L GISHOLT Universal Saddle Type Turret Lathe: New in 1942

NEW EUROPEAN MACHINE TOOLS

From Stock • No Priority

25/45x120 Oldfield-Schofield Cap Lathe $11500.
30/46x158 Safop Gap Lathe $9960.
No. 2 Alcera Plain Miller $3975.
No. 2 Saimp Universal Miller $4975.
No. 2 Saimp Vertical Miller $6090.
Matheys Vertical Miller, table 26x9 $1445.
Matheys Jig Borer, power feed spindle $3475.
14" Brook Shaper $1325.
18" Brook Shaper $1475.
16" Gernetti Universal Shaper $1825.
20" Gernetti Universal Shaper $2275.
24" Gernetti Universal Shaper $2425.
13"x40" Seveso Universal Grinder $3700.

Prices Include Motors and Controls

AUTOMATICS

2" Model A Cleveland. 1941
1⅝" Model A Cleveland. 1943
1-1/16" Model A Cleveland. 1943

BROACHES

HP-100 La Pointe Horiz. Broach. 1945
5 Ton 36" Stroke La Pointe Vertical. 1942

DRILLS, RADIAL

3' Leland Gifford Radial Tapper. 1941
18" Walker Turner. Late

DRILLS, SENSITIVE

MA-6 Avey 4 Spindle, H.F. 1943
Allen Single Spindle Drill & Tapper. 1942
No. 2B-8 Edlund Single Spindle. Late
No. 1B-7 Edlund Single Spindle. 1942
No. 2 LMS Leland Gifford, H.F. 1942
No. 1 LMS Leland Gifford, H.F. 1942

GEAR EQUIPMENT

No. 7 Gleason "Revex" Rougher. 1943
No. 6 Gleason Revacycle Generator. 1940
No. 72 Fellows H.S. Gear Shaper. 1942
16" Pratt & Whitney Hyd. Gear Grinder. 1942
15" Red Ring External Gear Lapper. 1942
No. 6 Gleason Angular Tester. 1942
3" Gleason Bevel Tester. 1941
Red Ring Universal Gear Checker. 1942
20M Fellows Red Liner Gear Tester. 1942
No. 7 LMS Fellows Lappers. 1942
No. 12 Gleason Tool Sharpener. 1943
No. 7 Gleason Cutter Sharpener. 1942

GENERATORS

7.5KW Clark Gasoline 1/60/115-230. 1942
2½ KVA Gasoline Driven 1/60/125. 1942

GRINDERS, CYLINDRICAL

16"x72" Norton Plain Type C. 1941
16/20"x36" Norton Plain Type "C". 1942
14"x168" Norton Plain Type "C". 1942
12"x66" Fitchburg Plain Hyd. 1942
12"x48" Cincinnati Univ. Grinder. 1942
10"x18" Norton Plain Type "C". 1940
10"x18" Landis Plain Type "C". 1940
No. 12 (6"x30") B & S Plain Hyd. 1940
No. 5 Brown & Sharpe Plain. 1941

GRINDERS, INTERNAL

No. 72-A3 Heald Plain Hydraulic. 1942
No. 24-36 Bryant Hydraulic. 1943
No. 16 CP 16 Bryant Hydraulic. 1942
No. 16-16 Bryant Hydraulic. 1942
No. 172 Heald Hydraulic. Gap. 1940
No. 50 Heald Plain Hydraulic. 1942
No. 4 Bryant Internal. 1940
No. 112 Rivett Universal Internal. 1940
No. 104 Rivett Internal-External. 1941

GRINDERS, MISCELLANEOUS

No. 600 UK Hanchett Face Grinder. 1946
No. 35 Excello Univ. Thread. 1940
6"x18" Norton Vertical Surface. 1942
No. 73 Van Norman Radius. 1942
14" Hammond Carbide Tool. 1942
Model F Blount Wet Tool. 1942
Oliver Template Tool Bit. 1942
Pratt & Whitney Deep Hole Drill. 1943
No. 1 M & M Saw Sharpener. 1944
48" Rogers Automatic Knife Grinder. 1942
No. 4T Sellers Carbide Tool Grinder. 1942
Pratt & Whitney Contour Cutter Grinder. 1942
Sundstrand Carbide Tool Grinder. 1942
No. 2 Oliver Arc Face Mill Grinder. 1942
Union Formed Cutter Grinder. 1942

GRINDERS, SURFACE

No. 10 Blanchard, 16" Chuck. M.D.

GUN BARREL MACHINES

No. ½ B x 50 P & W Reamer. Latest
No. ½ B x 30 P & W Reamer. Latest
No. ½ B x 50 P & W Rifler. Latest
800 Lb. Chambersburgh Steam. B.D.
No. 7B High Speed Rivett Hammer. 1942

LATHES, ENGINE

36"x296" American Geared Head. M.D.
27"x192" Niles Timesaver. 2 Carr. 1941
27"x120" Lodge & Shipley. Cap. 1940
27"x96" Niles Timesaver. 1940
26"x180" Betts Bridgeford. 1940
26"x96" Betts Bridgeford. 1940
26"x98" Rahn Meyer Carpenter. G.H.
No. 918 Rivett High Speed, Cabinet. 1943
No. 608 Rivett High Speed, Q.C. 1943

LATHES, PRODUCTION

No. 5D Potter & Johnston Automatic. 1943
8"x84" Lo-Swing Semi-Automatic. 1941
8"x168" Lo-Swing Semi-Automatic. DC-MD
14"x18" Model "R" Lo-Swing. MD
No. 6 LeBlond Multi-Cut. 1941
Lipe Carbo-Matic Lathe. 1942
Lipe Carbo-Lathe. 1942

LATHES, TURRET

No. 1L Gisholt Universal Saddle Type. 1942
No. 3R Gisholt Universal Saddle Type. 1943
No. H5 Libby Universal Saddle Type. 1939
No. 5 Gisholt Universal Ram Type. 1942
No. 3 Gisholt Universal Ram Type. 1942
No. 4 Midland Universal Ram Type. 1942
No. 4A Libby Plain Ram Type. 1941
No. 3R Libby Plain Ram Type. 1941
No. 4 Gisholt Simplified. 1941
No. 2 Warner & Swasey Simplified. 1941
No. 2A Warner & Swasey Univ. S.P.D.
No. 3A Warner & Swasey Univ. S.P.D.
No. 2G Morey Bar & Chucker. 1943
No. 601 WD Oster. Late

MILLS, PRODUCTION

M-18 Milwaukee Simplex. 1943
No. 1224 Milwaukee Simplex. 1943
No. 1-18 Cincinnati Plain Auto. 1940
No. 08 Cincinnati Vertical. 1943
No. 3A Sundstrand Copy Mill. 1943
Type C Hall Planetary Circular Form. 1942
Red Ring Two Spindle Profiler. 1942

MILLS, TOOL ROOM

No. 2 Cincinnati Vertical, M.S., D.T. 1940
No. 3 Van Norman Plain. 1942
No. 2L Van Norman Plain. 1942

MISCELLANEOUS

No. 2 Bakewell Precision Tapper. 1942
Model ASF Shuster Straightening & Cut-Off
No. D-60-Pa Ingersoll Rand Compressor
200 KV Keleket Production X-Ray. 1943
75 HP Gardner-Denver Air Compressor
No. 616 Cleveland "Rigidturner." 1942
No. 22 Pease Blue Print Machine. 1942
No. H-1 Micrometer Hone. 1942
No. 172 Barnes Vertical Hone. Late
No. 152 Barnes Vertical Hone. Late
No. 71 Excello Internal Lapper. 1942
No. 1 Savage Nibbler, ¼" Cap. 1942
Murchey Quickcentering Machine. 1942

PLANERS & SHAPERS

36"x36"x12' New Haven Planer
36"x36"x12' Deitrich & Harvey Openside
24" Stockbridge Plain Shaper. M.D.
24" Gould & Eberhardt Crank Shaper. Cone
12" New Haven Vertical Slotter. M.D.
8" Shape-Rite Shaper. 1945

PRESSES

650 Ton Verson Dbl. Act. Eccentric. 1940
Logan Hydraulic Straightening Press. 1942

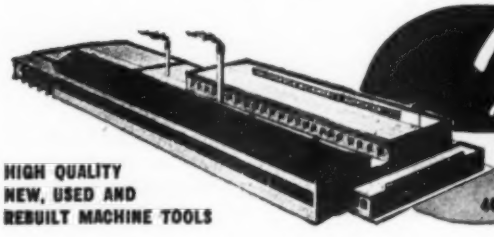
SAWS

No. 302 Campbell Abrasive Cut-Off. Late
No. 20 Campbell Abrasive
No. 8 Marvel Band Saw. Late

WELDERS

Taylor-Winfield Hi-Wave. 1940
28 KVA Taylor-Winfield Spot.

ALL MACHINES MAY BE INSPECTED UNDER POWER IN OUR WAREHOUSES



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Independencia 31-E, Mexico, D.F.

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AUTOMATICS

*1⅝" RAS Acme Gridley, Serial #40683, with threading, stock stand, reel.
*1⅝" RAS Acme Gridley, Serial #85013, with threading, reaming, stock stand, reel.
*1" RAS Acme Gridley, Serial #23455, with threading chip conveyor, stock stand, reel.
*9/16" RAS Acme Gridley, Serial #22965A, 22700BM, with chip conveyor, stock stand, reel.
*9/16" Acme Gridley, tooled for exhaust valves, 1945.
No. 676 New Britain Auto. Chucker. Ser. 23003.

BROACHES

*8 Ton American, 3 Way, Stroke 24", Vertical
3 Ton Foote Burt, Surface, 40" stroke, Dual Ram, Vertical
*7½ Ton, 24" stroke, Model HP LaPointe Horiz.

DRILL PRESSES

*#2B8 Edlund, Sgl. Spdl., No. 2 M.T. NEW
Avey Sgl. Spdl., No. 3 M.T., 24x24 table.
*Barnes H-3 Hydram, Sgl. Spdl. 6 Spindle Speeds
Edlund Two Spdl., No. 3 M.T., 20x40 table
Avey Two Spdl., No. 3 M.T.
Foote Burt 4 Spdl., No. 5 M.T., powerfeed, 92x20 table.
Leland Gifford Six Spdl., No. 2 M.T.
Model No. C-7 Natco Multiple Spdl., No. 2 M.T.
5' Baush Radial, No. 6 M.T., Powerfeed.

GEAR MACHINERY

*No. 140 Cleveland Rigidhobber
No. 17 Barber Coleman Gear Hobber
*No. 7125A Fellows Gears Shaper
*No. 12 Fellows Gear Shaver
*18" Red Ring Gear Grinder
*No. 15 and No. 25 Gleason Gear Quenching Press

Model #5B Farrel Sykes Herringbone Gear Generator, New in 1942, Serial #02842, Capacity 1" to 6½" Dia., Face 18" wide, Pitch 2 Max., 12 Min., 9½" dia. hole thru spindle, 6" pitch diameter of cutters, with motors, coolant, change gears.

Model #2A Farrel Sykes Herringbone Gear Generator, Serial #697-B Capacity 25" Dia. Face 8", Dia. Pitch 3 Max., 24 Min., 3⅝" hole thru spindle, 4" pitch dia. of cutters with motor and coolant.

GRINDERS

*No. A1-12 Arter Rotary Surface, 12" chuck
*No. 15 Covel Surface
*No. 112 Rivett Internal
No. 81 Heald Internal
No. 72A3 Heald Internal
No. 6G Sellers Drill, with coolant
*Thompson Oscillating Grinder
14 x 30", 17 x 42", and 17 x 48" Norton Crankshaft

LATHES

*10 x 24" Jackson Meiling Crankshaft Turning
*10 x 32" Atlas, with chuck and gears
*11 x 30" Sebastian, chuck, and face plate
*R-14 Seneca Falls Le-Swing, 16½" swing, 1941
18" x 90" Sebastian, Q. C. G.
*Gisholt Simplimatic, Air Operated Chuck
*18 x 80" Meuser Tool Room, NEW
*26" x 9' South Bend, chucks, face plate
255 Ton, Toledo No. 90-D Double crank, S.S. 6" stroke, 30" shut height, 51 x 87" bed area
*87 Ton, No. 4½ Bliss, 4½" stroke, 21 x 27" bed
75 Ton, Wells Gap Frame, Double Crank, 2" stroke, 80 x 20 bed, 11½" shut height
*65 Ton, No. 65 Walsh O.B.I., 4½" stroke, 32¼ x 18½ bed, New

TOGGLE DRAWING PRESSES

#2 ET-1086 BLISS TRIPLE ACTION, Capacity of plunger 650 Ton, of Blankholder 400 Ton, of Lower Ram 350 Ton, Bed area 62 x 86", 39" stroke of plunger, 26" of blankholder slide, Triple geared.

#410 BLISS DOUBLE ACTION, Capacity of plunger 525 Ton, of Blankholder 290 Ton, Bed area 50 x 72", 24" stroke of drawing slide, 16" of blankholder slide, double geared.

#794 ½B TOLEDO DOUBLE ACTION, Capacity of Plunger 280 Ton, of Blankholder 120 Ton, Bed area 45 x 72", 18" stroke of drawing slide, 12" stroke of blankholder, Double Back Geared.

60 Ton, Toledo No. 203-E Dbl. Crank, straight side, 4" stroke, 13 x 85½" bed, 16" shut height
*55 Ton, Walsh O.B.I., 4" stroke, 32¼ x 18½" bed, NEW
50 Ton No. 5 Bliss Cons. OBI, 3" stroke, 18 x 30 bed
50 Ton Henry & Wright Dicing Press, Roll Feed
*38 Ton No. 38 Walsh OBI, 4" stroke, 26¾ x 14 bed, NEW
*35 Ton, No. 62 Bliss, 5" stroke, 17 x 10 bed
*35 Ton, No. 62A Bliss, 8" stroke, 24 x 14" bed
*35 Ton, No. 162 Bliss, 4" stroke, 26 x 30" bed
PA-1, P-3, PA-3, P-4, and PA-4 Ferracute Presses
*Fameo, Foot & Arbor Presses, NEW

TAPPERS

*No. 1 Bakewell
No. 2X Garvin, ¾" to 1" Capacity
*Hydraulic Multi-Auto. Tapping Machines
Gaterman Pneu. Oscillating ¼" to ¾" Cap.
M & L Tapper, vertical table type
*Kaufman, ⅛" to ⅜" Capacity

THREADERS

*1½" Landis Bolt, Two Spdl., with die heads
*2" Landis Bolt, Sgl. Spdl., with die heads
2" Murchey, No. 22, Bolt, Two Spdl., lead screw type
*No. DC-6 Oster Williams Pipe, 6" Cap.
Economy Threading with hopper feed

WELDERS

*600 Amp General Electric Arc, Transformer Type
*Larkin Butt, 10 KVA, NEW
*Larkin Spot, 5, 7½, 10, 50 KVA, NEW, Immed. delivery
*¼" Graham Stud, 1951 Machines
75 KVA Fisher Spot, Air Operated Press Type

MISCELLANEOUS

*Ingersoll Rand 75 HP Air Compressor, 10 x 11 Air Cylinder
*Gisholt Static Balancer, No. 3 M.T.
*100 KW General Electric Synchronous Convertor Generator Set
Hanson Whitney 6 x 11 Thread Mill
*No. 40A Lees Bradner Thread Mill
*Kane & Roach Roll Former, 6 Stage
*14" Doall Vertical Band Saw, Butt welding attachment
*5 x 10 and 10 x 18 Johnson Band Saws, NEW
*No. 2G Morey Turret Lathe, 1" Capacity, chuck
*No. 1 Warner & Swasey Turret Lathe, ⅝" Cap., Bar Feed
*National Jr. Thread Roller, 5/16" Capacity
No. 2C Manville Thread Roller, 5/16" with hopper feed
*Troyke Rotary Tables from 9" to 25", NEW

* ASTERISK DESIGNATES LATE TYPE MACHINES

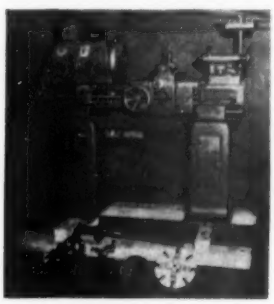
PAUL'S MACHINERY CO.
6111 VERMONT AVE. TYLER 7-6300
DETROIT 8, MICH.

MILLING MACHINES

1A Simmons Micro-Mill, Mfg. 1943 ..... $3000
No. 1 Kempsmith Universal, Dividing Head, tailstock, vise $1550
No. 3B Kearney & Trecker, Plain All Geared, Vert. head, M.D. $5500
0 & 00 Brown & Sharpe Hand Mills ..... $ 350

GRINDERS

No. 16 Blanchard Rotary Surface, 26" Chuck $4750
10"x24" Landis Type "C" Universal Cylindrical, Mfg. 1942 ..... $9400
10"x36" Cincinnati Cylindrical, Hydraulic Infeed $6750
14"x36" Hill Clarke Cylindrical, Rebuilt 1941 ..... $3000
No. 2 Cincinnati Centerless $3000



LATHES, ENGINE AND TOOL ROOM

13"x20" LeBlond "Regal" Mfg. 1943, Complete tooling, Excellent Condition $2400
16"x6' Monarch Geared Head Q.C.G., Motor Drive $1750
18"x10' Sidney "Tribl" Helical Geared Head Q.C.G. $5500
22"x23' Lodge & Shipley Geared Head, 12 speed headstock, M.D. $5450
36"x16' American Heavy Duty Geared Head, Motor Drive $4950

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BEHR *fact:*

The GARDNER DENVER COMPANY of Quincy, Illinois, are doing an excellent job machining eccentric shafts and miscellaneous work on their CINCINNATI cylindrical Grinder purchased from Behr's. The operator shown is John A. Neuman.

FIND OUT FOR YOURSELF CHECK THE LIST BELOW

LATHES

AMERICAN 16"x54", 1945
SUNDSTRAND No. 8, Stub, 1941
MONARCH 14x30, 1936

DRILLS

2—ALLEN MS No. 2½, PF, #3MT
CANEDY OTTO 3'7" Radial, New
BAKER No. 121
BAKER No. 312
BARNES Mod. 242, #5MT
BARNES Mod. H-3, Hydram, 1941
NATCO D-13-H, Mult. Spdl., Hyd.
EDLUND 6 Spdl. HF, #2MT, 2 Tap Spdl.
BODINE No. 42-30, 6 Spdl., 1946
BODINE No. 42-30, 6 Spdl., Tapper

PLANER

SELLERS 10' x 10' x 25'

TURRET LATHES

WARNER & SWASEY No. 2, Ser. #48127, 1939
4—GISHOLT No. 3, Univ., BF
WARNER & SWASEY No. 3, Electrocycle 1948
2—GISHOLT No. 5
LIBBY No. H-5
WARNER & SWASEY No. 1A, Pre., 1942
WARNER & SWASEY No. 2A, Pre., 1942
GISHOLT No. 3R
GISHOLT No. 3L, Tapper Attch., BF, Cross Slide Turrets, 1936
WARNER & SWASEY No. 4A Chucker, Ser. #298000
4—FOSTER Fastermatics, No. 4FU

MILLS

CINCINNATI No. 08, Vert., rotary table
CINCINNATI No. 1-12
SUNDSTRAND No. 1 Production
CINCINNATI No. 2MH, Plain
SAIMP No. 2, Vert., New
KEARNEY & TRECKER No. 3H, Horiz.
KEARNEY & TRECKER No. 2, Vert., 1931
INGERSOLL Duplex, 24"x36", 1942
CINCINNATI No. 4-48 Production

GOULD & EBERHARDT Shaper, 32", 1942

PRESSES

HENRY & WRIGHT Dicing, 25 ton, Late
MINSTER No. 50—5½—84, 48x84 Platen, 106 Ton
SHERIDAN 48x60 Upstroke Platen, 500 Ton
BLISS No. 25K Knuckle Joint, 24x24 Platen, 600 T

GRINDERS

HEALD Rotary Surface, No. 22, 1942
NORTON 10"x18", Hyd. Plain, 1943
NORTON 10"x36", Angular, Ser. #16604
HEALD Mod. 72A-5, Internal Surface, Ser. #15279
BRYANT No. 24-36

GEAR MACHINERY

8—BARBER COLMAN Type A Hobbers
2—GLEASON No. 12 Rougher & Finisher Ser. #19787 & 15790
FELLOWS No. 7125A Shaper, Ser. #19733
FELLOWS Mod. Z Shaper

SCREW MACHINERY

GREENLEE 1¼", 4 Spdl. Thread & Drilling Attch.
CONE 1⅞", 8 Spdl.
GREENLEE 2", 6 Spdl. 1940
CLEVELAND Mod. A, 3¾", Late
CLEVELAND Mod. B, 2½", Late
GOSS & DE LEEUW 7½", 6 Spdl. Aut. Checker, 1943

MISCELLANEOUS

BUFFALO Angle & Bar Shear, Cap. 4", Sq., 1944
PEERLESS Power Hack Saw, 6"x6", Ser. AX-141
CHICAGO PNEUMATIC Air Compresser, 10"x11", late
BARNES Type 306, Hyd., Vert.
MITTS & MERRILL Keyseater, No. 6

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Behr's Electric Motor and Control Department is capable of repairing, rewinding, and rebuilding every type of motor and electrical equipment. Charles Grenwald and August Orlandi are shown here putting the finishing touches on a 800 HP motor.

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Lodge & Shipley 14"x5' G.H., single pulley drive. 12 spindle speeds, 20" centers.
American 30"x14' American G.H. Lathe, complete with taper attachment.
American 36"x40' bed, Internal Face Plate Drive, 33' centers, 2½" hole in spindle.
American 24"x12' bed 3 SCD, motorized.
Lodge & Shipley 16"x126" centers G.H., Timken bearing, drop lever handles in apron, late type.
Bradford 20"x16' bed, 4 SCD, 12' centers.
Lodge & Shipley 20"x8' bed, single pulley.
LeBlond 17"8' bed 3 SCD.
American 16"x8' bed, 3 SCD, bowl head
Lodge & Shipley 16"x6', single pulley
LeBlond 15"x8' G.H., 9 spindle speeds
Lodge & Shipley 14"x6', 3 SCD
American 14"x6', 3 SCD bowl head.
American 30"x12', 3 SCD Lathe, 6' centers.
LeBlond 27"x10', 3 SCD Lathe, 3'11" centers.
American 24"x15' Lathe, vee-belt drive, 13' centers, 12 spindle speeds.
Boye & Emmes 26"x10', G.H., complete with taper attachment.

TURRET LATHES

Gisholt 1-L Saddle Type Turret Lathe, with bar feed, late type.
Oster 601 Rapiduction.
Warner & Swasey 2A, single pulley drive.

BORING MILLS—Vertical

Bullard 42", 4 jaw chuck table, late type.
Niles 36"-44", 1 rail and 1 side head.
Niles 42"-50" Driving Box Borer, Burnisher and Facer, motor drives, late type.
King 42", motorized, 2 heads on rail.
42-50 Niles Vertical Boring Mill, one rail and one side head, late.

GEAR MACHINERY

Gould & Eberhardt 18-H Hobber.
Gould & Eberhardt 96H Gear Hobber.
Gould & Eberhardt 60BM Gear Roughor.
Fellows 612 Spur Gear Shaper.
Fellows 725 Gear Shaper, with spur guide.

GRINDERS—Cutter & Tool

Oliver Template Tool Bit Grinder, late.
Sellers 4T Tool Grinder, late type.
Sellers 9T Tool Grinder, late type.

GRINDERS—Internal

Heald 78 Centerless, Internal & Cylindrical, late type.
Heald #50, tight & loose pulley.
Heald #78A, new 1941.
Heald 72A3 Plain Internal Grinder, late type.

GRINDERS—Cylindrical

Landis 26"x168" centers Plain, arranged for motor drive with motors, 10 speeds 3 to 62.
Landis #2 Universal, 12"x35" centers, belt drive.
Cincinnati #2 Universal, belt drive, 12x48.
Landis 16"x72" Plain Cylindrical.

GRINDERS—Thread

Jones & Lamson 8x31, late type.

MILLERS—Plain

Brown & Sharpe #3, 4 SCD.
Brown & Sharpe 4B Heavy, single pulley
Douglas #0, rectangular overarm.
Kempsmith #2, 4 Step cone drive, single back geared.

MILLERS—Vertical

Brown & Sharpe #3, single pulley drive.
Cincinnati #3, Single pulley drive.
Kearney & Trecker #4, motor in base, stationary head.

DRILLS—Radial

American 3'10" column Triple Purpose, gear box on base, 12 speeds.
Cincinnati Bickford 4'11" column, gear box on base.
Cincinnati-Bickford 3½', #4 Morse taper.
Fosdick 6'15" Heavy Duty Radial Drill.

PLANERS

Pond 48x48x16' Double Housing, DC drive, 4 heads.
Pond 84x84x16' Double Housing, DC drive, 4 heads.

SHAPERS

Smith & Mills 14" Plain Crank, Lima drive.
Gould & Eberhardt 20", B.G., gear box.
Averbeck 21" B.G., 4 SCD.
Potter & Johnson 24" Universal.
Gould & Eberhardt 24" B.G., gear box.
Smith & Mills 25" B.G., 4 SCD.
Columbia 28" B.G., gear box drive.
Gould & Eberhardt 28" B.G., gear box.
Gould & Eberhardt 32" B.G., gear box.
Smith & Mills 32" B.G., gear box drive.

BOREMATIC

Heald #42, late type.

MISCELLANEOUS MACHINERY

Fitchburg 48" Spline Grinder, late type.
Lincoln 200 Amp Arc Welder.
H&G Model I-K Threading Machine, late.
Taft Pierce Bench Center, 8"x48" centers.
Hoffman Heavy Duty Portable Cleaner.
Model #22 Rodgers Hand Track Press.
Gorton 3S Pantograph, late type.

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BORING MILLS—HORIZONTAL

Fosdick 3½" bar—Table 24"x50"—Outboard support—v-belt—MD
Landis 3½" bar Floor Type—Vertical travel 60"—Verniers—Outboard support—MD
Landis 4" bar Floor Type—Vertical travel 54"—Outboard support—MD
Fisher 5" bar Floor Type—Vertical travel 55"—Horizontal travel 50"—MD

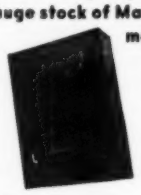
BORING MILLS—VERTICAL

Bullard 24", 36", 42" and 54" Turrets—Side heads—MD
Niles 38"/44" with side head—3-jaw chuck table—MD
Betts 6'—2 swivel heads—69" under cross rail—MD
Cincinnati 10'—Massive Type—2 swivel heads—MD

MISCELLANEOUS

Bertsch 1⅝" x 18' Pyramid Bending Roll—100 Hp Main Drive and 50 HP elevating motor—1944 machine
(3) Sleeper & Hartley Series 319 Flexible Casing Coilers—V-belt MD—Reels & stands
Giddings & Lewis #08T Horizontal Jig Miller—Table 18"x26"—Table cross travel 24" Spindle speeds 30 to 2000 RPM—MD—1947 machine
Lapointe #3L Horizontal Hydraulic Broach—Max stroke 52"—MD—1944 machine
Cincinnati-Bickford 7' 22" Master Type Radial Drill—24 speed head—AC MD
Landis 14" x 72" Type LC Universal Grinder—3-motor drive—Late Type
Heald #72A Universal Internal Grinder—Swing 26" Sizing bracket—MD—1943 machine
Blanchard #16 Rotary Surface Grinder—30" chuck—Rectifier—MD
Norton #2 Universal Tool & Cutter Grinder—Combination attch.—Internal spindle—MD—1942 machine

This is only a partial listing of our huge stock of Machine Tools of every make and description.



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Putnam Lathe, 42" x 10'.
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double-end — Model CM
swing 10" center distance 42"
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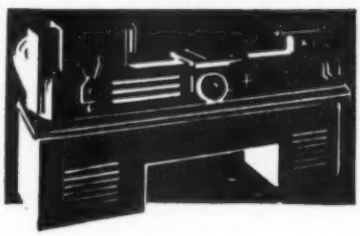

Motch & Merryweather's long experience in designing and building circular sawing machines and special machines for specific applications—experience as sales representatives for some 36 leading builders of machine tools—experience in the selection and rebuilding of used machinery—adds up to a particularly valuable asset for you to consider when purchasing used machines.

Here is a progressive organization with roots deep in the metal-working industry as the result of nearly half a century of serving the needs of this great industry.

Thus, because of its wide scope of services, Motch & Merryweather is recognized as a dependable organization with which to do business. Evidence of this is seen in the large contracts for defense tools which the used machinery division is and has been producing over the past year.

However, over and above our defense activities, we do have a limited number of rebuilt machines available for our customers. Moreover, as the urgency for defense machine tools eases, we will again have a much wider selection of used machines to offer discriminating users of these tools.

It will always pay you to see MOTCH & MERRYWEATHER first on your used machine requirements

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USED MACHINERY DIVISION 1250 EAST 222ND STREET EUCLID 17 • OHIO

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AUTOMATICS
2⅝" Cone 4 spdle., well equipped, 1936
#24 New Britain 4 spdle. chucker, 2½" cap.
¾" Model F Gridley, 4 spdle.

2" 4 SPINDLE CONEMATIC, THREADING SPDLE., TAPPING ATTACHMENT, BAR FEED, CONSIDERABLE TOOLING. EXCELLENT CONDITION. 1943

BORING MILLS
#42 Lucas, 4" bar, table type, late
No. 40 Landis floor type, 4" bar, rebuilt

GRINDERS
14" Hammond WD carbide tool, late
14x120" Landis plain cylindrical
#104 Rivett Universal, 1942, rebuilt
#4 Bryant Internal, auto. sizing
#70A Heald plain internal, 1940
No. 5 B & S cylindrical, 3x12" late
#33 Excello ext. groove, late type
#86—30" Gardner vert. disc grinder
14x36" Norton C semi-auto., cyl.
73 Heald Internal Centerless
73 Heald Internal, 1944, like new
P & W deep hole drill grinder, late
Model 1311 P & W contour, late

DRILLS
#2LMS Leland Gifford 4 spdle., hand feed
6'17" Carlton radial, DC motor, late
#12 Minster r., #5 M.T., box column
#2LMS Leland-Gifford, 26", hydraulic
#24 Footburt, 3 spdle., #5 M.T., 24"
#2 Allen, 2, 4, 6 spdle., #2 M.T.
#2 Detroit Semi-automatic, horiz.
Type 14 Natco 12 spindle
Model 4230 Bodine Drill & Tapper, 12 sta.
Moline Hole Hog, 2 spindle

GEAR MACHINERY
6" Gleason straight bevel generator
7A Fellows, shaper high speed, hvy dty
61A Fellows, shaper, high speed precision

LATHES
24x102" Reed-Prentice, g.h., quick change
27"x13' LeBlond, g.h., 16 speeds, late
30"x10' American geared head, taper att.
42"x25' American Hvy Dty, 2 carriages, late
48"x35' LeBlond Hvy Dty, taper, late
Hepburn Shell lathe, late
Gisholt Simplimatic, platen type, late
33" Niles vertical wheel lathe, 1930
48" Niles vertical wheel lathe, 1930

TURRET LATHES
#1L Gisholt Universal, 3" hole, 1937
#4D P & J auto. high speed, air chuck, late
Libby type H, 24" swing, 8 spdle. speeds
#4 W & S plain, Timken, #327217
#2 Simmons Microspeed, air chuck, late
#3 Gisholt Universal, late

SHAPERS & PLANERS
30"x30"x17' Cleve. Openside
48x48x14' Detrick & Harvey dble. hsg.
26" Smith & Mills shaper, 4 step cone

MILLS
#5 Cinn. horizontal, Lima drive
#1-14 Kent Owens production, late
#1½B K & T horiz., dble. overarm, rebuilt
Briggs production, hydraulic
10C Van Norman Contour

THREADERS
Lees Bradner Model B Cridon, late
#50 Excello Precision grinder, 28x68"
13" Automatic Machinery miller, late
#2 Dalzen grinder, 3" o.d. cap., late
LT636 Lees Bradner mill, 18 x 36", late
1½" Landis, 2 spdle., lead screw type

FURNACES
Whiting Converter, 2 ton cap., late
Model SP Juthe, gas, 1000° F
Lithdraw heat treat, 1200° F, late

PRESSES
#12 Zeh & Hahnemann precussion, 150 ton
#78½ Bliss straight side, 350 ton, sgle. crank
Ferracute type EG-52 embossing, 150 ton
Lucas 50 ton straightening, 24½" stroke
#57 Toledo, 150 ton, s.s., s.c.
#4 Toledo OBI, 25 ton, 2" stroke

MISCELLANEOUS
TAPPERS: Haskins 2CAM, 5/16", late
Cleve. Model EO, ½", late
BROACH: XL12 Oilgear, 60" stroke
HAMMER: 4000# Erie Steam, sgle. frame, late
KEYSEATER: #6-38 Mitts & Merrill, 4 x 36"
SPINNING RIVETER: Grant 5 spdle.
HAMMER: 300# Bradley Upright Helve
WELDERS: Hobart and P & H Arc, 400 amp.
BULLDOZERS: #2 Ajax High Speed, 30 ton

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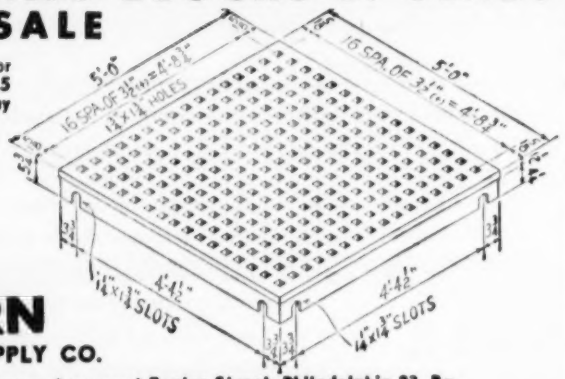
These blocks or slabs are 5 ft. x 5 ft. as shown. They are very useful for many purposes, such as for bending tables, layout, welding and assembly - work, etc.



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#4H Kearney & Trecker Vertical Miller
#2HL Kearney & Trecker Plain Miller
#2 Brown & Sharpe Vertical Miller
#1-60 US Multi Millers (2)
#1 Sundstrand Vertical Production Mill Hydraulic
#2 Cincinnati Centerless Grinders Filmatic (2)
48A Heald Borematic Single End Two Heads
#6 Brown & Sharpe Automatic 2½" Capacity
#9 Marvel Hack Saw 10"x10"
14"x14" Peerless Hydraulic Feed Hack Saw
#4W Acme Universal Turret Lathe 1½" Cap. Bar Feed
3'9" Cincinnati Bickford Super Service Radial Drill
CT36 Lees Bradner Thread Miller
4½x12 Pratt & Whitney Model C Thread Mills
GG19 Detroit Gear Grinders (2)
27"x9' Center Niles "Timesaver" Engine Lathe Taper
20"x15' Centers American 8 Speed Geared Head
4"x36" Seneca Falls Lo Swing Production Lathe
6WSL Reid Small Piece Production Lathe
H1 and H4 Micromatic Hydrahoners (4)
#71 Excello Internal Lapping Machines (2)
500 Ton Clearing Double Action Mechanical Press
150 Ton Ferracute No. E52 Knuckle Joint Coining Press
2" Cleveland Model A Single Spindle Automatic
Spot Facers Acme Table 25x33½ M.D.
#405 Osborne Jolt Rollover Molder
10 Gage 36" Throat Libert Hi Speed Rotary Saw
A21 Reed Thread Roller
150 KVA Federal Seam Welder
Taber Foundry Cut Off Saw
#724 Excello Shell Turning Lathe
#4FU Foster Fastermatic Platen Type
24" Cincinnati Bickford Drill Press No. 477
8" Red Ring External Gear Shaver Model GCC-268
#2 Brown & Sharpe Universal Cylindrical Grinder
#340 Ohio Super Finisher

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60"x60"x20' NILES PLANER
35 HP. D.C. Reversing Drive—4 Heads
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35 HP D.C. Direct Drive, 2 Swivel Rail Heads.

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Vinco Master Involute Checker 1943.
Wickman Precision Optical Tool & Profile Grinder.
2—Seneca Falls Model U 5"x12" Lo-Swings.
1—Norton Camomatic Grinder, 5"x42", 1942.
1—Hill Acme 1¼" Threader, Mod. XL, 1943, with Idscrew.
1—Cross #50 Gear Chamferer, hyd.

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BORING MILLS

24" Bullard Spiral Drive Vertical Turret Lathe—1942
42" Bullard New Era Vertical Turret Lathe

GEAR MACHINERY

#64 Fellows Gear Shaper—1942
10" Pratt & Whitney Two Wheel Hydraulic Gear Grinder—1943
#4B Fellows Gear Burnishing Machine—1945

GRINDERS

6" x 30" Landis Plain Hydraulic Cylindrical—Hyd. Rapid Infeed
10" x 36" Landis Type C Plain Hydraulic Cylindrical—1941
10" x 36" Cincinnati Model EA Plain Hydraulic Cylindrical—1939
14" x 36" Norton Type C Plain Hydraulic Cylindrical—Plunge Cut—1943
#5 Brown & Sharpe Plain Cylindrical
#81 Heald Sizematic Internal
#72 A 5 Heald Long Base Sizematic
12" x 36" Norton Type L Universal—1941
#95-110" Bridgeport Face Grinder—1943

LATHES

14" x 30 Reed Prentice Sliding Gear Head—1939
14" x 54" Lodge & Shipley High Speed—1938
16" x 48" Bradford Geared Head Quick Change—1940
18" x 84" Sydney Monotrol—1941

MILLERS

#1854 Milwaukee Duplex—1942
#1218 Milwaukee Simplex—1941
18" Cincinnati Plain Manufacturing—1941
#24-24" Milwaukee Plain Manufacturing—1940
#4K Kearney & Trecker Plain—1942

TURRET LATHES

#3 Gisholt Universal—1942
#4 Gisholt Universal—1941
#1L Gisholt Universal—1942
#2L Gisholt Universal—1941
#1 Warner & Swasey Electric Head—1944
#2 Warner & Swasey All Geared Head—1939
#1A Warner & Swasey—Bar Feed—1939
#2A Warner & Swasey—Preselector Head—1941
#6W Cincinnati Acme Universal—1943
#2 Simmons Micro-speed—1942

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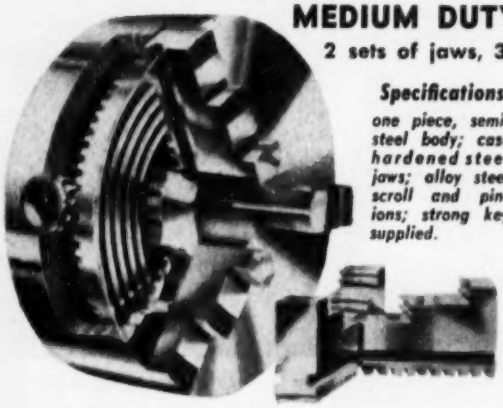

MEDIUM DUTY 3 JAW UNIVERSAL CHUCKS

2 sets of jaws, 3 pinions, for use with intermediate backplate.

Specifications *one piece, semi-steel body; case hardened steel jaws; alloy steel scroll and pinions; strong key supplied.*

Size	Weight	Price	Price Soft Jaws
2¾"	2½ lbs.	$ 25.00	$ 5.00
3¼"	3½	26.50	6.50
4"	6½	30.00	7.50
5"	12	37.50	9.00
6"	17½	45.00	10.00
7½"	29	57.50	13.50
9"	42	67.50	15.00
10½"	62	95.00	20.00
12"	88	125.00	22.50
15"	143	175.00	25.00
18"	200	250.00	35.00
24"	324	325.00	45.00

Steel body chucks are also available in some sizes.
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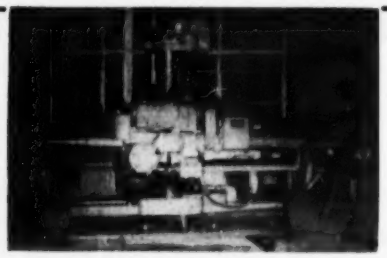

KEYSTONE—UNIVERSAL MODEL 143-2, SERIAL #6917

Planton Type—Horizontal travel of column—54"
Spindle—3" dia.—30" travel #5 M.T. Ball Bearing
Vertical Travel—32"
Column—12" Dia.
360° swivel of head horizontally
180° swivel of head vertically

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#9A Jones & Lamson Turret Lathe—new 1941 Serial #6107—Rebuilt and guaranteed
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3'9" Column Cincinnati Bickford Radial Drill Serial #2A-41—new 1936—Rebuilt & guaranteed
72" Rebuilt King Heavy Duty Vertical Boring and Turning Mill—Serial Lot 38-#175
Late Type Rebuilt 3¾" Bar Defiance #5A Table Type Horizontal Boring, Milling, Drilling and Tapping Machine—Serial #870-38
Ingersoll Adjustable Rail Planer Type Milling Machine—Serial #3158—Reconditioned and guaranteed
#64 Fellows Gear Shaper Ser. #26113
#64A Fellows Gear Shaper—Ser. #25634
Rebuilt 6' 15" Column American Triple Purpose Radial Drill—Serial #35592.
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6D Potter & Johnston Automatic Chucking Machine Serial #70393
16" Gould & Eberhardt Shaper—Ser. #66737

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#12 and #22L Van Norman Ram Type Millers.
#2 Avey Six Spindle Drill, Power Feeds.
13"x30" Pratt & Whitney Toolroom Lathe — Taper, Collets.
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New 18" x 80" Centers MEUSER LATHE and 24" x 120" Centers MEUSER LATHE. Complete with Taper Attachments, Chucks and all equipment. *GAP BED TYPE.* Available from stock all sizes up to 32" Swing. Will trade for other equipment.

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326 W. OHIO ST. INDIANAPOLIS 2, IND.
PLaza 2408

NEARLY NEW

GLEASON 3" CHECKER, serial #25080.
GLEASON #7 SHARPENER, serial #24768.

W. C. COWDEN MACHINERY CO.
1207 W. Genesee St., Syracuse 4, New York
Phone 3-7787

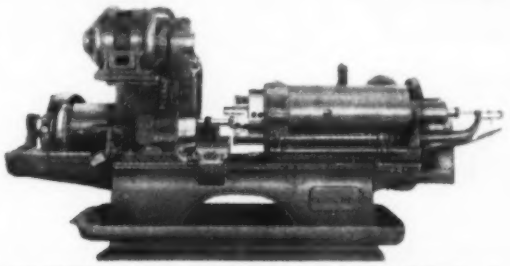
CONE AUTOMATICS

(3)—3½" Four Spindle
(1)—2⅝" Four Spindle
(1)—1½" Four Spindle

CURRIER MACHINE SALES
P.O. Box 1503
1055 State St., New Haven, Conn.

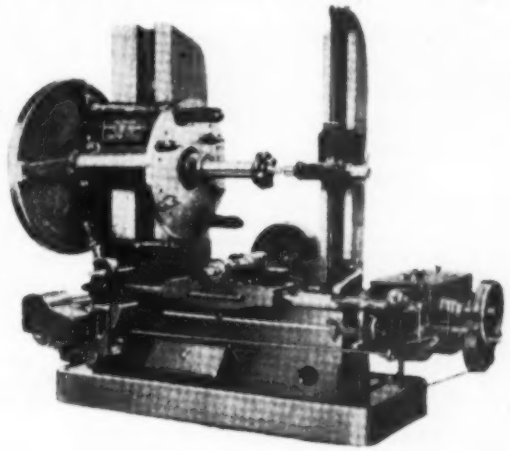
PARAMOUNT ASSORTMENT of NOLL STANDARD REBUILT MACHINE TOOLS

Study your plant layout for possible "slow down" of production. One or more of these machine tools may be what you need to supplement your capacity and increase production.



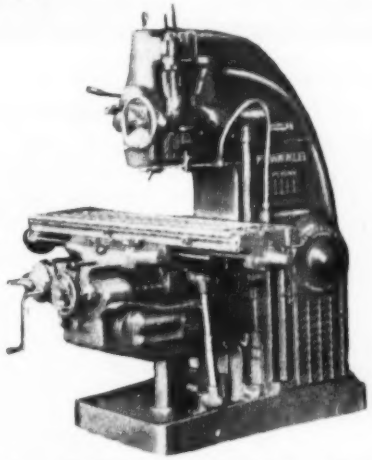
CLEVELAND AUTOMATIC MODEL A

RANGE—Bar Capacity Solid Stock: Round 5¾", Hex 5", Sq. 4", Stock Feed Length 12½."
SPINDLE HEAD—Spindle Speeds—32. All Bearings anti-friction. Spindle Speeds all Forward.
ELECTRICAL SPECIFICATIONS—15 hp 600/900/1200/1800 rpm 3 phase 60 cycle 220-440 volts. Ball bearing motor frame 445 constant HP-2 winding thermal box on right side of facing shaft 2" knockout and with thermo guard.
3 HP 1200 rpm 3 phase 60 cycle 220-440 volts ball bearing motor frame 254 with ¾" knockout in the terminal box.



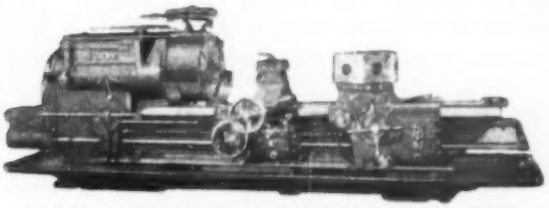
NEWARK GEAR CUTTER #5

Complete with Electrics. Serial Number 800—Feb. 1941 machine.
MOTOR: 5 HP—1200 rpm.
SPECIFICATIONS: Maximum diameter cap.—72", Minimum diameter cap.—0, Face cap.—16", Pitch cap.—2 D.P. in steel—1½ D.C. in C.I., 1½" D.P. in steel—2" C.P. in C.I. Minimum centers between cutter and work spindle—3". Hole in spindle—8". Cutter arbor keys—⅜" x 3/16". Cutter speeds—8 changes—19 to 128 rpm. Weight—10,900#.



KEARNEY & TRECKER #3H VERTICAL MILL

Serial Number 8-3650. Motors: 7½ Hp 220-440 volt.
SPECIFICATIONS: Table 64x13½", Power Feed: Long—34", Vertical—17", Cross—12", Sliding Head—6". Feeds: longitudinal and cross—½"-30". Number of feeds—32, Speeds 20-1000 rpm, number of speeds—16, Rapid traverse.



LIBBY HEAVY DUTY TURRET LATHE
MODEL No. 3H-10

SPECIFICATIONS: Swing over ways ins. dia.—29, Spindle hole ins.—10¼, Turret carriage travel 72", Motor hp—25 to 50, Tool post carriage travel—66½", Speed of motor rpm 1500 or 1800, Range of Feeds (Cross or Longitudinal) ins. .007 to .500, Threads per inch 2 to 128, No. of spindles 8, Spindle speeds 8 to 125. Approx. wt. 22,500.

WRITE, WIRE OR PHONE EXPRESS 1-0700 TODAY

NOLL EQUIPMENT CO.
4537 ST. CLAIR AVE. CLEVELAND 3, OHIO
MONA

LAKE IS GEARED TO INDUSTRY'S MACHINE TOOL N-E-E-D-S

AUTOMATIC SCREW MACHINES
- #2 BROWN & SHARPE Auto. Screw Machines (2)
- #0 BROWN & SHARPE Auto. Screw Machines (4)
- #0G BROWN & SHARPE Auto. Screw Machines (4)
- GREENLEE Auto. 4 spindle 1" capacity
- #6 BROWN & SHARPE Auto. Screw Machine
- 1-1/16 - 1⅜ CLEVELAND Model A Auto. Screw Machine

TURRET LATHES
- 2G MOREY Turret Lathes (3)
- 3L GISHOLT Cross Sliding Turret
- 1F FOSTER Fastermatic Turret Lathe
- #2 BROWN & SHARPE Wire Feed (3)
- #1 BROWN & SHARPE Wire Feed
- #0 BROWN & SHARPE Wire Feed (2)

PUNCH PRESSES
- #5 BLISS Solid Back (2)
- #3½ BLISS Solid Back tiles type (1)
- #21 BLISS O B I, (3)
- #19 BLISS O B I, (4)
- #6B32 VERSON 150T
- #95½ TOLEDO 250T

MILLS
- #1A MILWAUKEE with TREE Vertical head
- #1½ BROWN & SHARPE Universal with tree Vertical head

GRINDERS
- #1 NORTON Universal T & C Grinder
- #2 CINCINNATI T & C Grinder
- #13 BROWN & SHARPE T & C Grinder (2)
- #1½ GRAND RAPIDS T & C Grinder (2)

DRILLS
- #2 AVEY—3 spindle type MA6
- 3'-7" ROYAL Radial Drills NEW (2)
- 16" ROYAL Floor Drills NEW (5)
- 16" ROYAL Bench Drills NEW (5)
- 6' x 13½" CINCINNATI Bickford Radial U.S. Vari drive.

MISCELLANEOUS
- 6" JONES Vertical Slotter M.D.—1940
- 2 to 5 HP Buffers (11)
- #0 LAPOINTE Horizontal broach
- #2 LAPOINTE Horizontal broach.
- XA3 Oilgear Hydraulic Broach.
- #V-18 AMERICAN Vertical Broach
- Semi Automatic Nut Forming Machine.
- ⅛" NATIONAL DSSD HS Cold Header (2)
- NIAGARA #180 Combination Machine
- BLISS #112 Rotary Trimmer
- YODER G. 36 Rotary Gang Slitter
- #0 SLEEPER HARTLEY Spring Coiler
- #354 NIAGARA Roll Forming Machine

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★ SERVING THE INDUSTRY SINCE 1920.

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LAKE MACHINERY COMPANY
942 WEST LAKE STREET • CHICAGO 7, ILLINOIS

FIVE STAR EXTRA ★★★★★ VALUES

Rice's "GUARANTEED QUALITY" MACHINE TOOLS

- ★ #2L GISHOLT UNIVERSAL TURRET LATHE. New 1943, Pre Selector Head, Bar Feed, Chuck, Extra Fine Condition. Also #1 & #4 With Extra Long Bed.
- ★ #5 CINCINNATI HI POWER HORIZONTAL MILLING MACHINE. Gap Type Rectangular Overarm For Oversize Cutters. Automatic Table Cycle.
- ★ ¼"x54" DREIS & KRUMP ALL STEEL SHEAR. 18" Gap, Like New.
- ★ 3'11" AMERICAN TRIPLE PURPOSE RADIAL DRILLS (2).
- ★ BARNES 2 & 5 Station Vertical Boring Machines.

Plus Complete Stock of Excellent Late Type and Older Used Machine Tools As Well As Selected New Foreign Machines.

THIS IS A PARTIAL LISTING ONLY. SEND US YOUR INQUIRIES. MONA

Robert W. Rice & Company, Inc.

210 S. CLINTON — Financial 6-0782 — Chicago 6, Ill.

Directly Across from Chicago's Union Station

AUTOMATIC

2⅝" Conomatic, 8-spindles, with 40 HP. motor 3/60/220, including conveyor, collets, pushers, bushings, gears, cams, two threading spindles, with accelerated reaming and tapping attachment. New October 1942.

THREAD MILLER

12" x 30" Morey-Shields, with internal and external chasing heads, motor 3/60/220-440 V. (1942). Used little.

GALBREATH MACHINERY CO.
306 Empire Bldg., Pittsburgh 22, Pa.
COurt 1-3413

#3 Brown & Sharpe Universal Grinder.
30" x 48" LeBlond Lathe H.D. Timken Bearing.
#2L Van Norman Miller
Immediate Delivery From Stock
CAnal 6-7957-7958

ATLANTIC *Machinery Exchange*
212 CENTRE STREET NEW YORK 13, N.Y.

- #2 Cincinnati Centerless Grinder—Filmatic
- #3 Morey Univ. Turret Lathe
- 20" x 8' Monarch Lathe—Timken
- #1 Waterbury Screw Slotter—MD
- #14 Excelsior Angle Bending Roll—MD
- #3S —Cincinnati Miller—Div. Heads——Vert.
- #5 Manville
- #3½, #5 Waterbury Cold Headers

KALLOR
199 Centre St., New York, N. Y.
Phone CAnal 6-2912

DOUBLE CRANK PRESS
#12-9B ZEH & HAHNEMANN
80 TON CAPACITY, 49" between uprights
NEW IN 1947 — IN STOCK
CENTRE MACHINERY CO.
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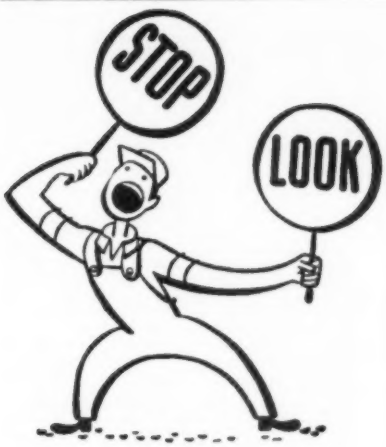
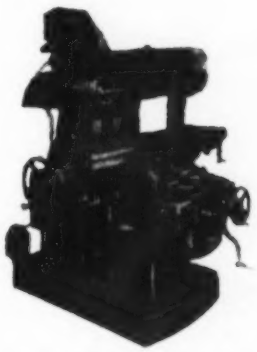
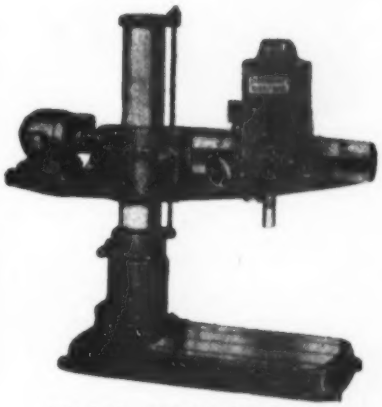
LeBLOND Center Drive Lathe
EXCELLENT CONDITION—BARGAIN
WINSTON MACHINERY CO., INC.
326 West Ohio St. Indianapolis 2, Ind.



Good-late-type MACHINE TOOLS



No. 36 VAN NORMAN Ram Type Plain Miller.



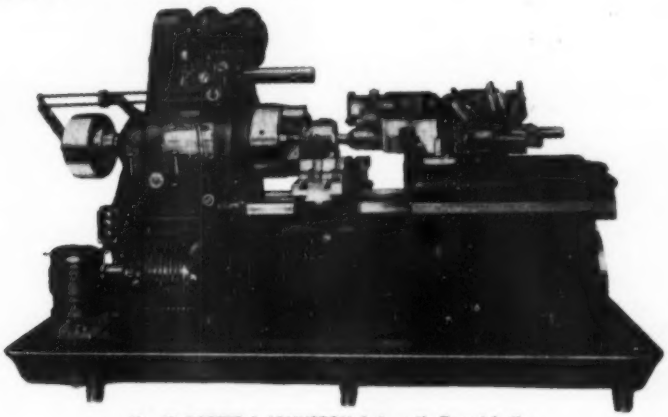
3'9" CINCINNATI BICKFORD High Speed Radial Drill.

BORING MILLS

No. 32 LUCAS Horizontal Boring Mill
No. 0 GIDDINGS & LEWIS Horizontal Boring Mill
No. 45 GIDDINGS & LEWIS Horizontal Boring Mill
100" BETTS Heavy Duty Vertical Mill, 2 heads. M.D.

LATHES

14"x54" REED PRENTICE Geared Head Lathe
16"x30" LODGE & SHIPLEY Selective Geared Head Toolroom Lathe.
27"x168" LeBLOND Heavy Duty Engine Lathe.
30"x16' bed AMERICAN "High Duty" Geared Head Lathe.
42"x15' bed AMERICAN Heavy Duty Geared Head Lathe.
42"x30' bed AMERICAN Heavy Duty Geared Head Lathe.



No. 4D POTTER & JOHNSTON Automatic Turret Lathe.

GEAR EQUIPMENT

#54 FELLOWS Spur Gear Shaper, M.D.
#72 FELLOWS Spur Gear Shaper, M.D.
#725A FELLOWS High Speed Gear Shaper.
#12 FELLOWS Gear Shaving Machine.
#36-BM GOULD & EBERHARDT Gear Rougher, M.D.

AUTO. LATHES & TURRETS

#4D POTTER & JOHNSTON AUTO. Turret Lathe.
#6S POTTER & JOHNSTON AUTO. Turret Lathe.
#1L GISHOLT SADDLE TYPE Univ. Turret Lathe.
#3A WARNER & SWASEY Heavy Duty Univ. Turret Lathe.
#3 JONES & LAMSON RAM Type Universal Turret Lathe.
#2 ACME Univ. Saddle Type Turret Lathe.

GRINDERS

6"x18" CINCINNATI Plain Hyd. Cyl.—Filmatic
6"x18" LANDIS Type C Plain Hyd. Grinder
6"x18" NORTON Vertical Surface Grinder
10"x24" LANDIS Universal Grinder.
10"x72" LANDIS TYPE C Plain Hyd. Grinder
No. 104 RIVETT Internal Grinders
No. 72A3 HEALD Plain Internal Grinder
No. 172 HEALD GAP Internal Grinder.
No. 73 HEALD Internal Centerless Grinder.
No. 2 BROWN & SHARPE Universal Grinder.

MILLING MACHINES

No. 08 CINCINNATI Plain Millers.
Nos. 1-8 and 1-14 KENT OWENS Millers.
No. 2M CINCINNATI Vertical Millers.
No. 1-18 CINCINNATI Plain Prod. Miller.
No. 36 VAN NORMAN Plain Ram Type Miller.
No. 2 BROWN & SHARPE Light Type Plain Miller.
36"x36"x12' and 16' INGERSOLL Planer Type Milling Machines, three heads, M.D.

MISCELLANEOUS

4½"x36" PRATT & WHITNEY Model C Thread Miller.
4¾" CONOMATIC 4-Spindle Auto. Screw Machine.
3'9" CINCINNATI BICKFORD H.S. Radial Drill.
PRATT & WHITNEY Upright Shaving Machine.
Model E-5 NATCO Multiple Spindle Drill.
38" MORTON Heavy Duty Draw-Cut Shapers, 1945.
24"x24"x6' GRAY DOUBLE HOUSING Planer, 2 heads, M.D., 1941.
Model V-16 DOALL Contour Saw & Band Filer.
No. ½B×50" P & W Two Spindle Reaming Machine.

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WIGGLESWORTH INDUSTRIAL CORP.

203 BENT ST., CAMBRIDGE 41, MASSACHUSETTS

KIRKLAND 7-5242

QUALITY TOOLS — GUARANTEED SATISFACTION

No. W-6 Baush Hydraulic Multiple Spindle Drilling Machine (similar to illustration) 18"x36" head; Texrope Drive; 44" diameter rotary table; EXCELLENT CONDITION. New in 1945
No. W-7 Baush Hydraulic Multiple Spindle Drilling Machine (similar to illustration) 36" diameter round head; 44" diameter rotary table; Texrope Drive, EXCELLENT CONDITION. New in 1945.

RADIAL and DRILL PRESSES

No. 262 Barnes 2-Spindle, 15 HP, New 1943
5-Spindle Kingsbury Multiple, New 1946
C-7 Natco 24 Spindle, No. 1 M.T.

3'-10" column Fosdick Radial, gearbox, M.D.
3'-9" column Morris Radial, gearbox, M.D.
3B—12" Edlund 2-Spindle, BG, PF, New 1943
No. 5 Foot-Burt 4-Spdl. and 7-Spdl. Multiples, M.D.
2½' Walker Turner Radial, ½" capacity, new 1948
20" & 24" Barnes 4-Spindle All-Geared Camelback
20" & 22" Barnes 1 and 2-Spdl., Camelback, M.D.
No. 410 Barnes Deep Hole Horiz., 2 Spdl., 1945
D-5 Colburn 25" Hvy. Duty Single Spdl., No. 5 M.T.
5'-15" column Fosdick Radial

BORING MACHINES & MILLS

24" Bullard Vertical Turret, Spiral Drive, M.D.
No. 61 Excello Angular 4-Spindle

60" Niles Vertical, 2 swivel ram type heads, M.D.
Heald Single End Boring Machine, M.D.

GRINDERS

No. 6-G Sellers Drill, 3" capacity, New 1941
No. 5 B. & S., 3"x12" pl. cyl., plunge cut, 1942
No. 70-A and 75 Heald Internal, M.D., Not late
No. 10 Blanchard 16" Rotary Surface, 1939
10"x36" Norton Plain Cylindrical, 1935
10"x24" Norton Hydraulic Surface, new 1944
No. 6 Bryant Chucking, M.D.
6"x18" Landis Plain Cyl. Hydraulic
33-L Excello Thread, Universal Dresser, TA, 1943
No. 24-53" Gardner Vert. Spdl. Horiz. Disc, M.D.
No. 86-30" Gardner Vert. Spdl. Horiz. Disc, M.D.
10"x18" Norton Cylindrical, Factory M.D.
No. 73 Heald Airplane Cylindrical, Int. Late

LAPPERS & HONES

26-F Norton Hyprolap, New 1943
H-713 Micromatic Hyd. Vert. 2-Spdle. Hone, latest
172 Barnes Hyd. Vert. Hone, ⅝" to 2", 1942

SHAPERS

12" and 17" Smith & Mills, Gearbox M.D.
16" & 20" Gould & Eberhardt, vee Ram, M.D.
Hansen-Whitney Toolroom Vert., 14" rot. tbl., M.D.
20" Ohio Back Geared, Helical Gears

MILLING MACHINES

No. 2 B. & S. Light Type Univ., complete, 1936
No. 2G Hendey Univ., Dividing Head, Vise, M.D.
M-80 T. & F. High Speed Duplex Spline, Late
4" P. & W. Duplex Spline Millers, M.D., (2)
No. 1 United States Hand, M.D.
18" Cincinnati Duplex, (2) motor belted, M.D.
No. 1 Brown & Sharpe Vertical, M.D.

TURRET LATHES

No. 5 Warner & Swasey Univ., Bar Fd., 1943
No. 3 Bardons & Oliver, Air Chuck, Late

LATHES

13"x5' South Bend, T.A., chucks, M.D.
13"x7' South Bend, QCG, TA, new 1942
16"x36" Pratt & Whitney Mod. "B" Toolroom
1" Rivett Precision Screw Cutting Collets, New '44
No. 9 LeBlond Multi-Cut, air chucks & cyl. M.D.
14"x30" Ladge & Shipley, new 1942
14½"x5' South Bend Q.C.G., TA, New 1942
18"x72" c.c. Ladge & Shipley, geared head M.D.
16"—24"x10' Monarch, G.H., gap, 72" c.c., t.s.
30"x8' centers Wickes Geared Head, TA, M.D.
8" Seneca Falls "Imp" Production Lathe 1941

SCREW MACHINES

1½" Model 264 New Britain 6-spindle, Auto.
2½" Conomatic 4 Spindle Automatic, new 1934
1" Footburt Single Spindle Automatic, 1940
⅞" Model "B" Cleveland Automatic, M.D.
⅞"-1-1/16" Cleveland 4 spindle automatic
1½" Model "B" Cleveland 1-Spindle, 1943

SHEARS & BRAKES

No. 1038 Verson Press Brake, 52"x18 ga. new '41
64"x1¼" Trinier Allsteel Hydraulic, New 1945
1"x48" Williams & White Plate, M.D.
New No. 1272 Wysong & Miles, 6'x12 gauge
No. 652 Niagara 52"x10 ga. 18" gap, M.D.

PLANERS

36"x36"x10" Woodward & Powell, 2 heads on rail

PRESSES and PUNCHES

43 Ton Reliance High Speed O.B.I., new in 1946
No. 4 Walsh Dble. Crank, 18"x43" bed, B.G., M.D.
No. 14 Toledo Horn (3)
No. 16 Robinson 71-Ton Dbl. Crank, 30"x32" bed
300 Ton Elmes Hydraulic Press, 38"x38" bed
No. 83 General Flexible 8 Ton Power Press
Nos. 4, 5½ and 6 Bliss Open Back & Back Geared
No. 207 Bliss, s.s., tie rod, 180 ton Capacity

MISCELLANEOUS

10" Pedrick Pipe Bender, complete with dies, '43

Gear Hobber: No. 3 Barber-Colman, M.D.
Gear Hobber: No. 18-H Gould & Eberhardt, M.D.
Gear Shaper: No. 75 Fellows High Speed

15 KW Gen. Elec. Induction Heater, New 1949

Profiler: No. 12 Pratt & Whitney 2-spindle
Screwdriver: Model "B" Detroit, New 1939
Spring Winder: No. 0 Sleeper & Hartley Univ.
Welder, Spot: 25 KVA Taylor-Winfield, timer
Welder, Spot: 15 KVA Acme, Air operated Arm
Wire Stripper: Type CP and CB Artos

VICTOR MACHINERY COMPANY
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AIR COMPRESSOR, 64 C.F. I-R Model ER-I, Late
AUTOMATIC, 1¾" 4 spin. Gridley Model G
BOLT THREADER, 1½" Williams Reliance
BORING MILL, 100" N.B.P., 2 Hds., M.D.
BORING MILL, 100" Cinci. Massive, 2 Hds., M.D.
BORING MILL, 72" King, 2 Hds., P.R.T., M.D.
BORING MILL, 72" N.B.P., 2 Hds., P.R.T., M.D.
BORING MILL, 4½" bar G. & L. No. 45, Tble.
BORING MILL, 3½" bar Giddings & Lewis #0
BORING MILL, 3" bar Lucas, Table Type
DRILLS, RADIAL, 4' Western, M.D. (2)
6' Amer., 18" col. Trip. Purp., M-on-Arm
5' Amer., 18" col. Trip. Purp., M-on-arm
5' Amer., 14" col., Trip. Purp.
5' Niles #10 Rightline, Univ., Motor-on-arm
4' Amer., 13" col. M-on-Arm
3'6" & 2½' Arbega (Swedish), Late
TABLES, RADIAL, 36"x20"x20"
DRILLS, #8D Colburn 36", 5" capty.
#314 Baker, 24", 2" capty.
24" Cinci. Bick., Tapping, M.D.
#2LMS Leland Gifford, Deep Hole
FLANGERS, ¾" and ½" McCabe (2)
GEAR CUTTER, No. 13 B. & S. Spur & Bevel
GEAR SHAPERS, Nos. 6, 61A, 64 & 64A Fellows
11" Rieneeker, Bevel
Nos. 75 & M61 Fellows (2)
GRINDER, SURFACE, 14"x36" P. & W.
GRINDER, 4"x18" Landis #4H, Cylindrical, Late
GRINDER, No. 6T Sellers Tool, 1942
GRINDER, Micro Internal, large capty.
GRINDER, 18"x144" Norton Cyl., M.D.
HAMMER, 1000 lb. Chambersburg Pneumatic, 1947
KEYSEATER, No. 3½ Baker, 24" str. x 4" wide
LATHES, 48"x20' cen. N.B.P., M.D.
48"x20' bed, Amer. T.A., Grd. Hd.
32"x14' bed Schumacher Boye T.A., M.D.
28"/48"x16' bed Reho Larmon, Gap
26"x12' Bridgeford, QCG Grd. Hd., M.D. (2)
24"x12' bed E. & E., T.A., Grd. Hd.
20"x78" Matra, T.A., New
20"x10' bed Amer. Grd. Hd. M.D.
20"x10' bed L. & S., T.A., M-in-Base
18"x10' bed L. & S., T.A., Cone Motorized
18"x8' bed L. & S. Selective Grd. Hd., M.D.
16"x60" cen. P. & W. Motor-in-base
16"/32"x8' Harrington Gap M.D.
16"x8' & 12"x8' Hendeys (2)
14"x8' bed Amer. T.A., M-in-base
10"x56" bed Sheldon, New 1946
No. 3x42" Hendey Turning (1200 r.p.m.)
TURRET LATHES, No. 3A Warner & Swasey, 1943
No. 3AL Gisholt, 6¼" H.S.
No. 3 Gisholt, 1942
No. 2B Foster Univ., 3¼" Capty., Bar Timken
No. 1B Foster Univ., 2" capty. M.D.
21" Acme Universal Brass, Late
18" Libby Model A Grd. Hd.
MILLER, No. 22L Van Norman, Late
MILLER, No. 3 Cinci. HI Power, Motorized
MILLERS, Nos. 2 & 3 Cinci. HI Power Univ., M.D.
MILLER, No. 2 Stand. K. & T. Univ. #50
MILLER, No. 2 Van Norman Ram, M.D.
MILLERS, No. 2 Abene (like Van Norman) New
MILLER, No. 1½B K. & T. Univ., Grd. Hd.
MILLER, No. 000 B. & S. Plain, M.D., Late
MILLER, No. 0 Sundstrand Rigidmil, Hand
THREAD MILLER, 12"x60" Morey Shields, '42
PRESS, 73½ Bliss S.S., 8" stroke
PRESS, No. 58 Toledo S.S., Grd., 171 ton capty.
PRESS, 250 Bliss 36", "Silver", Late
SQUARING SHEAR, 6'x3/16" Geo. Ohl

BENNETT MACHINERY CO.
375 Allwood Road, Clifton, N. J.
Off Route S-3, Phone Prescott 9-8996
New York Phone: LOngacre 3-1222

HYDRAULIC PRESS

100 Ton, 4 Column Press. 36x52 Bed Area. Manufactured 1945.

Complete with 3 Air Cushions

WINSTON MACHINERY CO., INC.
326 West Ohio St. Indianapolis 2, Ind.

STRUCTURAL STEEL

PLAIN OR FABRICATED TO ORDER

FOR CONSTRUCTION OR INDUSTRIAL USES

A wide range of sizes in stock

SEND US YOUR INQUIRIES & SPECIFICATIONS

IRON AND SUPPLY CO.

ACORN IRON & SUPPLY CO.

Engineers - Designers - Fabricators - Erectors

DELAWARE AVE. AT POPLAR ST., PHILADELPHIA 23, PA.

MACHINERY FOR SALE

1—24" Bullard Vertical Turret Lathe, Serial #16496.

1—American Radial Drill Press 3 Ft., Serial #57224.

1—Cincinnati Radial Drill Press 3 Ft., 9" Diam., Serial #12-2653.

1—Production Air Tracer Lathe 13"x42" Monarch Mona-matic with 15 hp motor, 1800 rpm, serial #MM31848-AT, purchased in February, 1949. New Machinery Guarantee. *Immediate delivery. Fully equipped.*

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GARRISON, 12" shaft, 48x64 bed, single crank
TOLEDO Nos. 164½, 174

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BLISS Nos. 18, 19, 19C, 20, 20B, 21, 21½, 23 & 28
FERRACUTE C2, C3, C4, C5, & C6
V & O Nos. 00, 0, 01, 1, 2, 4, 101, 102, 103 & 104, Flywheel & Geared, with Dial & Roll Feeds
ZEH & HAHNEMANN Nos. 36-4 & 36-5
NIAGARA Nos. A1¼, A2, A3, A3½, A4, M.D.

STRAIGHT SIDE

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FERRACUTE E-3 & E-4 with Roll Feeds
FERRACUTE DG-53 & DG-54 Geared
FERRACUTE GG-56—20" stroke Deep Draw Press
NIAGARA No. 510 Geared with Side Shear
TOLEDO No. 59¼, Twin Flywheel Forging, 400 Ton

BLISS No. 88, 255 Ton Capacity 18" Stroke. Air Cushion, M.D. 40 H.P. motor

BLISS #505W

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BLISS No. 7 with Dial Feed
TOLEDO No. 93½C, Bed Area 48" x 36" equip with 36" wide Automatic Roll Feed
NIAGARA No. 68C, Bed 48" x 30" with Air Cushion & Air Clutch
CLEVELAND 65G72 Gap Frame, Bed 96" x 24"
WILLIAMS & WHITE No. 34 Gang Punch
TOLEDO 93½E, Bed Area 42" FBX 60" RL, 12" Stroke
TOLEDO 91-42 Bed Area 28" FBX 42" RL 12" Stroke
FERRACUTE SG 106, Bed 42" FBX 84" RL. 100 Ton Cap.
CLEVELAND 45-D-60

GAP FRAME AND DEEP THROAT

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BLISS No. 31, 58, 61 & 62, M.D.
BLISS-STILES No. 2, 3, 4, & 5. No. 2C & 3C
FERRACUTE P-1, P-2, P-3, P-4, P-5, & PG-6, M.D.
TOLEDO Nos. 15 & 17 Deep Throat

DOUBLE ACTION—CUT & DRAW

ADRIANCE Nos. 44, 45 & 46 Strip & Roll Feeds
ADRIANCE 16 Die Crown Cap Press
BAIRD Nos. 2 & 3 Tandem Roll Feed Transfer
BLISS Nos. 1, 1½B, 3½, 5 & 6 Cam & Crank
TOLEDO No. 68 Geared
WATERBURY-FARREL Nos. 1, 2, 2½, Feeds
BLISS Nos. 65N, 68N, and 69N O. B. I.
BLISS No. 822 Strip Feed Presses

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WATERBURY 25 Ton, Flywheel
ZEH & HAHNEMANN Nos. 7, 8½, 10 & 12

WILLIAMS & WHITE 29U BULLDOZER

HORNING & WIRING

ADRIANCE, CALLAHAN—Nos. 23, 24 & 25
BLISS Nos. 2A, 4A & 5A Adj. Bed
BLISS Nos. 16, 39, 40 & 41 Adj. Tables
FERRACUTE Nos. CA-4 & CAG-4 M.D.
FERRACUTE No. PA-4 & PA-5 End Wheel Type

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WATERBURY-FARREL No. 06 & 156, Cam Type
No. 6600 Ammunition Type

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WATERBURY-FARREL No. 1 Slip Roll, No. 1 Step Cone
WATERBURY Nos. 1, 2 & 3 Upright Roll Continuous Wire drawing
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MISCELLANEOUS

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Chambersburgh 2500 lb. & B&S 1200 Board Drop Hammers
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CAMPBELL No. 401 Cutomatic, New in '42
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FELLOWS 61A Gear Shapers 1941
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HEALD 22 12" Rotary Surface Grinder 1941.

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SENECA FALLS Model R-14 Lo-Swing Lathe 1942.
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CINCINNATI 1-18 Production Mill, 1943.

SHAPERS

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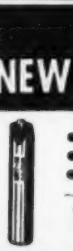

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If you're an experienced methods or process engineer who's looking for a change that spells c-h-a-l-l-e-n-g-e, one of many big openings at Honeywell might fit you.

What we face is the realization by industry that "the prime force behind the 20th century industrial revolution *is* automatic control."

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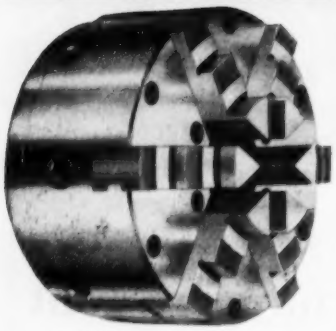
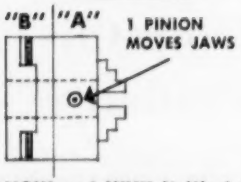
First in Controls

The UNIVERSAL Chuck with .0005 PRECISION!





HOW and WHY It Works

Chuck gripping section "A" is like any scroll chuck with one pinion to move jaws. (accurate to .003"). Section "B" shows how chuck "floats" on adapter (.020" clearance) where 4 opposed screws move chuck on adapter for adjustment to dead true precision. Jaws always come back within .0005" on duplicate work.

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The firm grip of 6 jaws for soft metal or tube work . . .

An end to most needs for stub arbors, mandrels, or special fixtures . . .

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The greatest development of recent years to save machinists' time . . .

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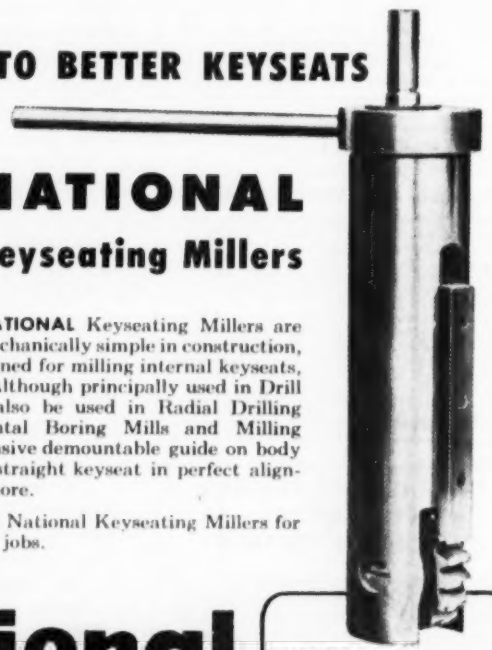

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WRITE TODAY
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complete, handy size

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Bay State Taps

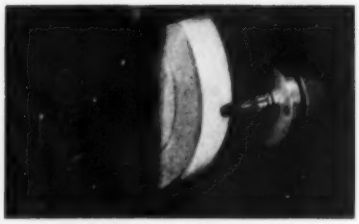
...for precision **plus** performance.
On nearby shelves of
Industrial Supply Distributors.

BAY STATE TAP & DIE COMPANY • MANSFIELD • MASS.

A Proven Method of Reducing Your Tap Breakage

Excessive tap breakage means excessive production costs. That's why so many manufacturers use the precision tap sharpening method to keep tap breakage at an absolute minimum.

What is the precision tap sharpening method? Briefly, it consists of grinding each tap precisely to produce uniform spacing of its cutting edges, accurate and equal hook angles on each cutting edge, and concentric chamfers.



CLOSE-UP OF PRECISION TAP SHARPENING

Photograph shows one method of holding small tap on Blake Tap Chamfer Grinder to reduce vibration at point being ground.

THE IMPORTANCE OF PRECISION SHARPENING

Taps with uneven cutting edges are especially vulnerable to breakage. Uneven cutting edges mean errors in indexing. One land of the tap is ahead of the other, thus placing a greater share of the load on that land and causing it to cut deeper and oversize. Precision sharpening corrects these errors. A tap cutting evenly on all lands is much stronger, much less apt to break, and it cuts closer to size.

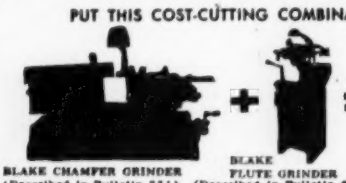
BLAKE TAP SHARPENING EQUIPMENT

The Blake Flute Grinder and Blake Tap Chamfer Grinder are the two machines which enable you to grind taps to the high degree of accuracy necessary to keep tap breakage down to a minimum.

For more information, write us for MACHINERY article, "Why Taps Should Be Sharpened Precisely" and descriptive Bulletins on both Blake machines.

IT'S A FACT! YOU CAN REDUCE YOUR TAP COSTS 50 to 75% by installing Blake tap sharpening equipment and sharpening your taps as you do other metal cutting tools.

PUT THIS COST-CUTTING COMBINATION TO WORK FOR YOU NOW!



BLAKE CHAMFER GRINDER (Described in Bulletin 851)

BLAKE FLUTE GRINDER (Described in Bulletin 651)

ACCURATE, TRUE-CUTTING TAPS
LESS TAP BREAKAGE
600% MORE PRODUCTION PER TAP
UP TO 75% REDUCTION IN TAP COSTS

Write for details about both machines!

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BLACK DIAMOND PRECISION DRILL GRINDERS . . . WALTHAM CUTTER SHARPENERS . . . SURFACE FINISH STANDARDS

From the *American Machinist* Library of *Tips for Top Shop Men*

TAKE a man's pride in his job away, and there isn't much left; he becomes another automaton. Even a trained seal enjoys the applause as much as he does the fish.

WHEN you walk the tight-rope between close tolerances, or between good and bad finish, balance is vital. Be sure you have it, in machine-tool spindle or shaft, in tooling, in fixture. It will pay out in longer tool life and reduced scrap.

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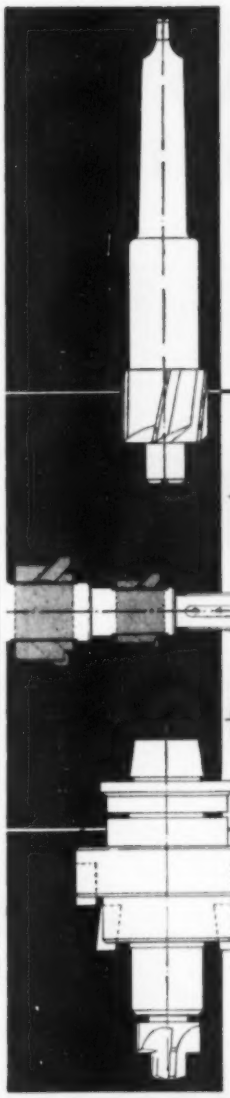

Ask for the New Standard Tool Catalog and Price List!

STANDARD CUTTING TOOLS
Interchangeable Counterbores and Countersinks in *Economy*, *Quick-Change* and *Heavy-Duty* types . . . with standard, threaded, and full-floating holders. Interchangeable Back Spotfacers and Core Drills . . . Tungsten-Carbide Tipped Counterbores.

E-Con-O-Mill Standard Milling Cutters
The same blades and locks fit cutters from 5 to 16" dia., provide savings in tool inventory, grinding costs and machine down-time.

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For production rough boring, semi-finishing, reaming. Quick-change blocks center automatically, without centralizing screw holes.

Gair-Lock Fine Tooth Cutters
Tapered, serrated wedges provide firm hold on inserted blades, require minimum space. Gair-Lock Catalog shows special applications.

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From small multi-diameter cutters to large-scale tooling programs, Gairing engineers have cut production costs in many leading industries. Gairing representatives are well qualified to discuss any cutting tool problem with you.

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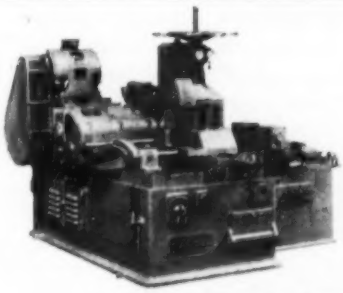
Write for the Gairing Standard Tool Catalog and Price List, showing Interchangeable Counterbores, Countersinks and Holders, Back Spotfacers, Core Drills, Block-Type Boring Tools, and the "E-Con-O-Mill" Standard Face Mills . . . or ask your local Gairing Representative.



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Circular Cold Sawing
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- **FULLY AUTOMATIC HYDRAULIC**
  Capacities: 3½" to 9½" rounds
- **SEMI-AUTOMATIC**
  Capacities up to 13½" rounds

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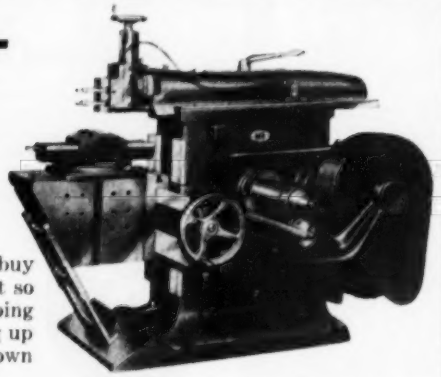
75A West Street **New York 6, N. Y.**

Now ~~72~~ 93 Busy Plants Are Cutting Machining Costs with KLOPP High-Production Shapers



IMMEDIATE DELIVERY FROM STOCK

KLOPP shapers cost so little to buy . . . so little to run, yet turn out so much production, they're stepping into plant-after-plant—stepping up toolroom output and cutting down costs.

Bulky, awkward-to-handle work pieces are easily accessible and simple to set up in the KLOPP—because the *head travels to the work*. It's built for high-speed, too, by Europe's largest manufacturer of shapers—at KLOPP'S fully integrated plant—where the complete machines, including all their components from castings to electric motors, are produced.

Write for names of prominent KLOPP users near you. And ask us to quote on your requirements for one or a battery of these fast-producing cost cutters.

Engineered servicing from Orban Service Centers in Cleveland, Detroit, Newark. Stock parts from Cleveland.

SPECIFICATIONS

MECHANICAL SHAPERS—stroke lengths 16¾", 20⅔", 26⅝". Six rates of speeds with normal motor, 12 with two-speed motor. Accelerated return motion. Single lever control within easy reach of operator. Swivel work table can be set to either side at any angle up to 90°.

FULLY HYDRAULIC MODELS—stroke lengths 26", 33½", 39½". Infinitely variable ram speeds with quick return and minimum power consumption. Central operator control panel. Tool holder with graduated scale swivels 45° to either side. Self-acting downfeed of tool slide. Automatic tool lifting device available.

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From the *American Machinist* Library of *Tips for Top Shop Men*

SABOTAGE is a greater potential danger for most plants than bombing. Have you taken any precautions to guard against it?

MORALE isn't built in a crisis; it's built beforehand. The crisis only tests it.

THERE'S an old saying that "If you want to be big, you've got to look big." Nobody likes a fourflusher or a fop, but everybody has been trained from childhood to expect a leader to look like one. Company policy can't earn respect on the major things either, if it is small on the minor things. Don't make your company look small.

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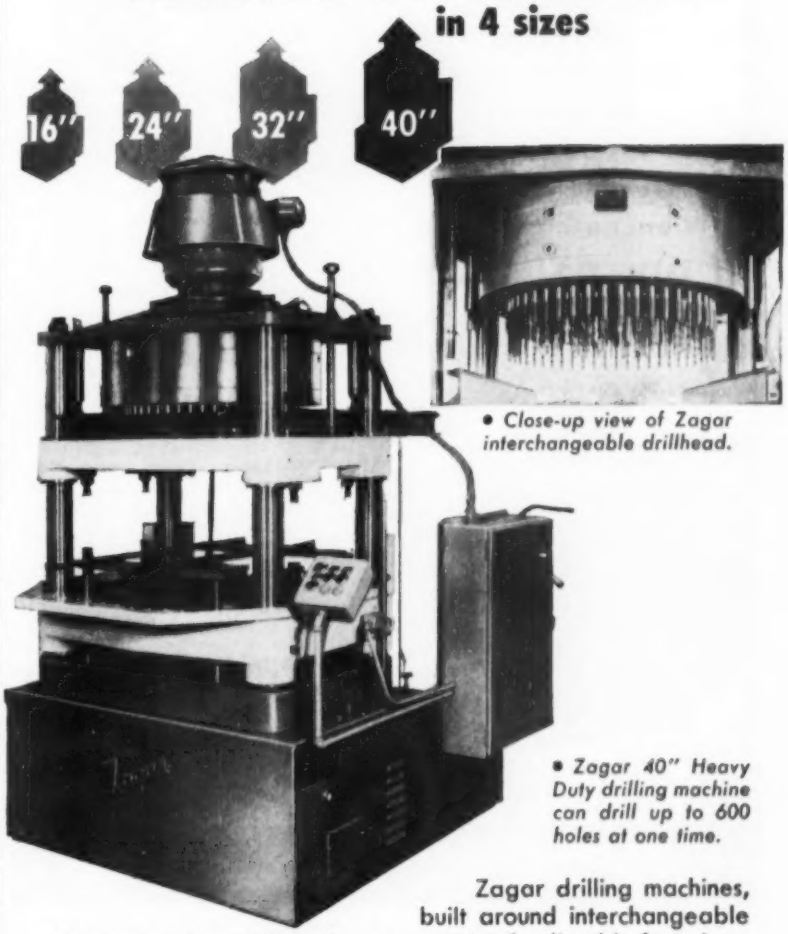
NEW Zagar HEAVY DUTY 40" DRILLING MACHINE

Successful line is now standardized in 4 sizes



• *Close-up view of Zagar interchangeable drillhead.*

• *Zagar 40" Heavy Duty drilling machine can drill up to 600 holes at one time.*

Zagar drilling machines, built around interchangeable Zagar gearless drillheads, are now standardized in four sizes. The new heavy duty 40" machine lifts the scope of the line to such jobs as turbo-jet engine frames. Yet simplicity of design enables set-ups to be made or changed over in a few hours. You get greater horsepower, thrust, and rigidity and better alignment than in conventional drill presses. Greatly broadened, therefore, is Zagar's facility for drilling any number of holes at one pass, in any pattern on centers as close as twice drill diameter.

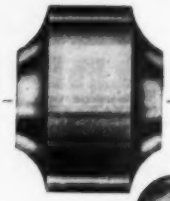
ZAGAR TOOL, Inc.

24000 Lakeland Blvd., Cleveland 23, Ohio

Zagar TOOLS FOR INDUSTRY and SPECIAL MACHINERY

Write for Engineering Manual A-1

Making parts like these?



Both radii concentric with bore

Both ball ends concentric with shaft axis

You can Centerless Grind all Surfaces Simultaneously, Insure perfect Concentricity on a DIVERSIMATIC

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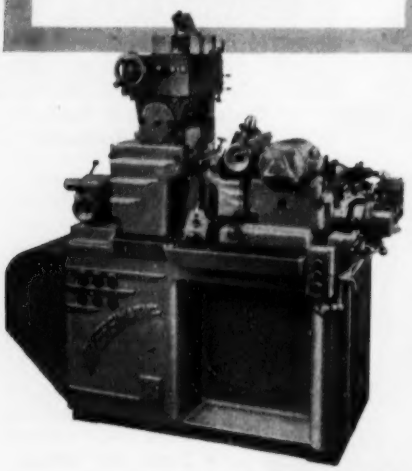
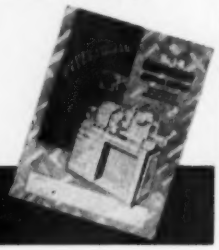


CRUSH FORMING profiles the wheel to exact contours; imparts these shapes to rough-turned parts, grinding all surfaces simultaneously. Where formed parts require only a nominal amount of metal removed, *they can frequently be ground from the solid!*

CRUSH FORMING on centerless grinding is exclusive with DIVERSIMATIC. It's possible only because of Diversimatic's unusual, deflection-free, anti-friction spindle . . . *The spindle that needs no warm-up!*



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WHAT you say and what you write must agree. You can't post a memorandum that lays down a policy, then nullify it by word of mouth—and vice versa. If you do, the least criticism you'll get is that you're changeable-minded. And charges that you're two-faced and a liar are more likely.

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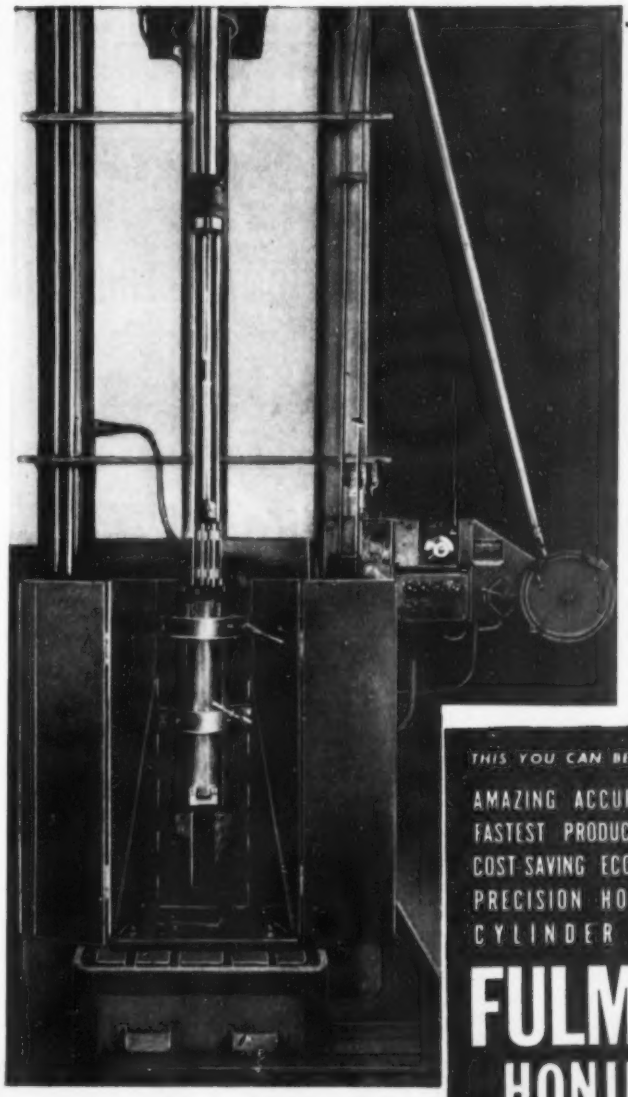

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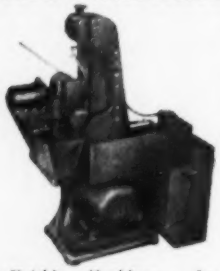

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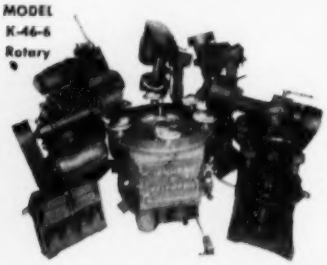
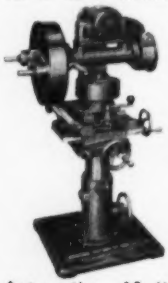
Cylindrical Finishing Machines — For tubes, bars and cylindrical shapes: Model OD-1 up to 2¾" diameter polishing or buffing. Model OD-9 with polishing wheel or belt, for ¼" to 9" diameter.

MODEL K-46-6 Rotary



Rotary and Strait-Line Automatic Finishing Machines — For fast production polishing, buffing, deburring and brushing — Model K-46-6 Rotary shown. Write for catalog on Rotary and Strait-Line Automatics.



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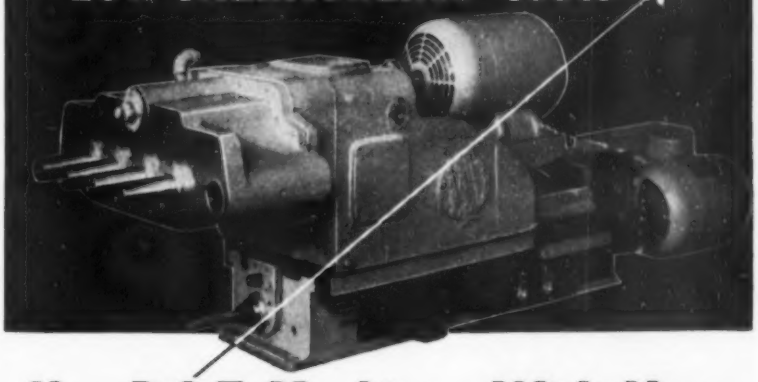
For High Production and Low Maintenance Costs *



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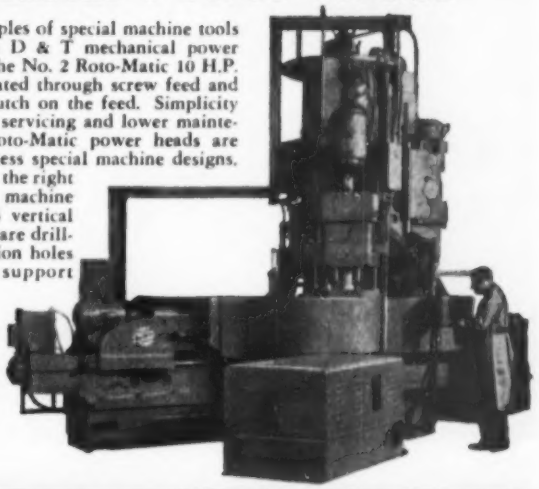
Here are two good examples of special machine tools designed and built with D & T mechanical power heads. Shown above, is the No. 2 Roto-Matic 10 H.P. head. All sizes are operated through screw feed and have overload release clutch on the feed. Simplicity of design makes for less servicing and lower maintenance costs. D & T Roto-Matic power heads are readily adapted to countless special machine designs. For instance: Machine to the right is a 6 station indexing machine with 3 horizontal and 3 vertical power heads. Operations are drilling and reaming suspension holes and king pin holes in support arms for power heads.



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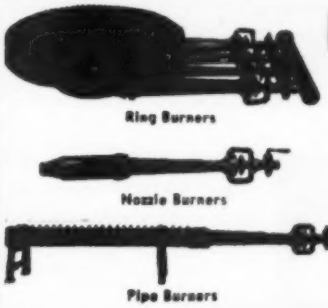

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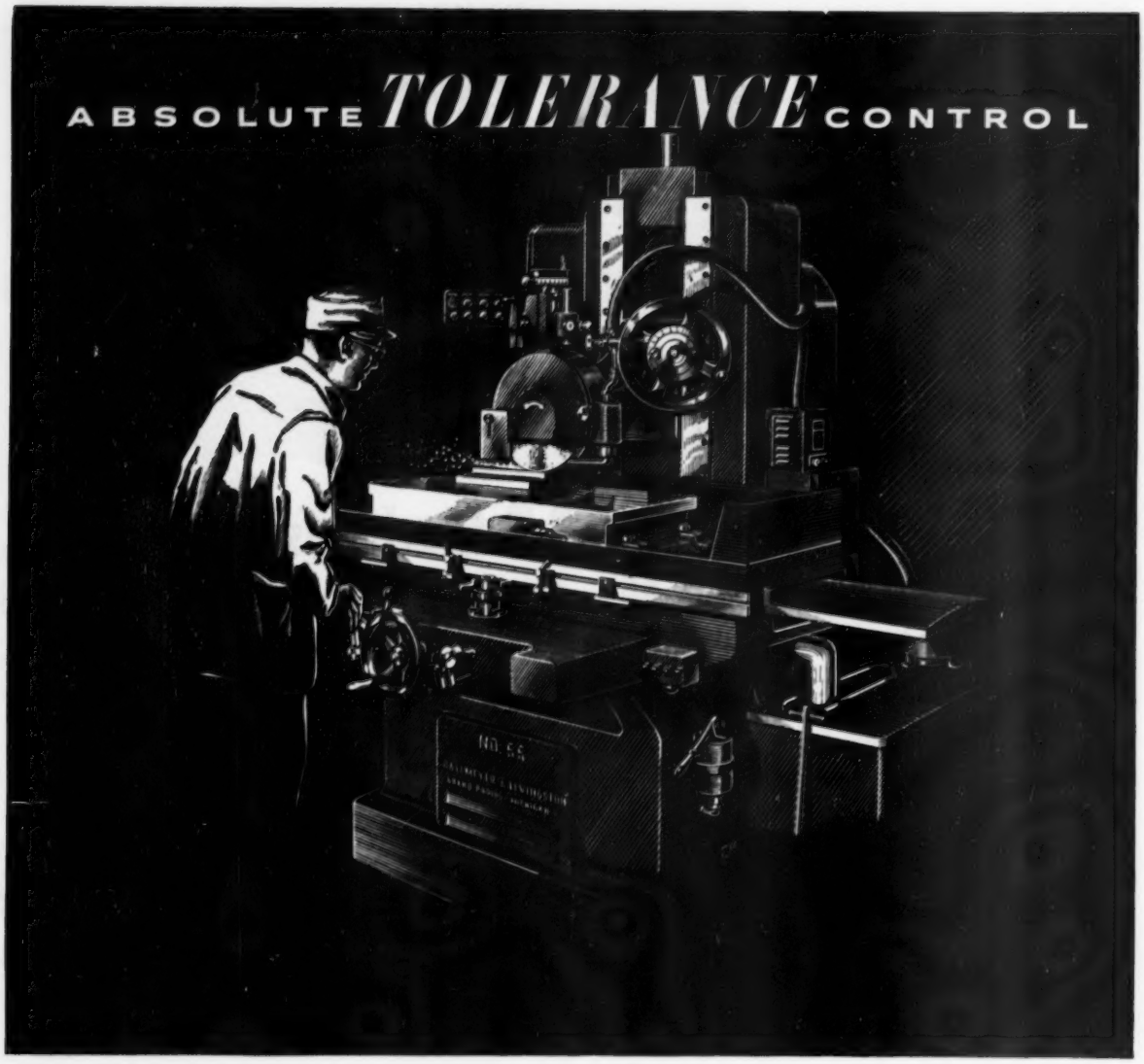

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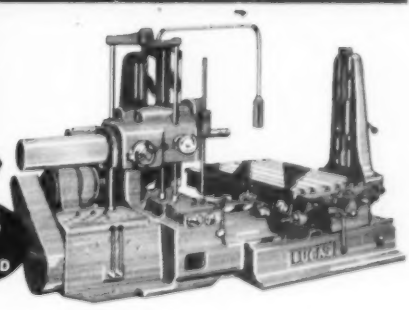


4-A lathe gets A-1 precision with TIMKEN® bearings

THIS Warner & Swasey 4-A turret lathe hogs off tough metal in a hurry, yet provides the high precision demanded for today's close-tolerance parts. Warner & Swasey engineers assure both precision and ruggedness by mounting the spindle and 12-speed gear train on Timken® tapered roller bearings.

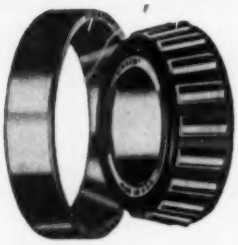
Whether you're using a one-inch drill or making a 28″ turning cut, Timken bearings maintain spindle precision and accurate gear mesh day in and day out. They are tapered in construction to take radial, thrust and combination loads. Line contact between rollers and races provides maximum capacity. Shafts are held in rigid alignment. Gear mesh is smoother, more accurate. Shaft wear is eliminated, gear wear reduced.

True rolling motion and an incredibly smooth surface finish combine to make Timken bearings practically friction-free. They're made from Timken fine alloy steel—finest steel ever developed for tapered roller bearings—and rollers and races are case-hardened for hard, wear-resistant surfaces and tough, shock-resistant cores.

No other bearing can offer you all the advantages of Timken bearings. Be sure to use them on the machine tools you build or buy. And look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

Here's how THE WARNER & SWASEY CO. uses Timken bearings in its 4-A turret lathe to insure high precision, trouble-free performance.



TIMKEN

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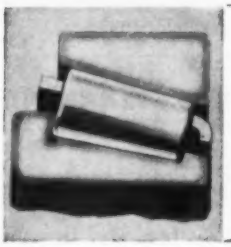

GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

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